

Aptitude, 2017 EC, entrance exam, version 2

Grade 12 · Aptitude · 2017 E.C.

MARKING KEY: CONFIDENTIAL

Time allowed: 120 minutes

Questions: 55

Total marks: 55

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1. CALF : COW :: LAMB : ?

(1)

A. ✓ Sheep

B. Deer

C. Horse

D. Horse

Answer: A

The two words on the left name a young animal and the adult it grows into: a calf grows into a cow. A lamb grows into a sheep, so Sheep completes the pair. Deer is the tempting answer because a deer is also an animal you see grazing in a field, but the young of a deer is a fawn, not a lamb.

2. BOOK : PUBLISHER :: FILM : ?

(1)

A. Writer

B. Editor

C. Director

D. ✓ Producer

Answer: D

The link is between a work and the person who pays for it and brings it out to the public. A publisher does that for a book, and for a film that role belongs to the producer. Director is the tempting answer because the director leads the making of the film, but leading the work is not the same as funding it and releasing it, which is what a publisher does.

3. EXTROVERTED

(1)

A. Shy

B. ✓ Outgoing

C. Deceiver

D. Energetic

Answer: B

Extroverted describes a person who turns towards other people and takes energy from company, so the closest word is outgoing. Energetic is the tempting answer because extroverts often look lively, but energy is about how much drive a person has and says nothing about wanting company. Shy is the opposite of the word.

4. ASSERTIVE

(1)

A. Passive

B. Aggressive

C. ✓ Confident

D. Hesitant

Answer: C

Assertive means stating what you want or believe in a firm, steady way and standing up for yourself. Confident carries that same steadiness. Aggressive is the trap because it sounds forceful too, but it adds hostility and pressure on other people, which assertive does not carry.

5. DISINTERESTED

(1)

A. ✓ **Impartial**

B. Biased

C. Bored

D. Unconcerned

Answer: A

Used carefully, disinterested means having nothing to gain from the outcome, so the person can judge fairly. That is what impartial means. Bored is the trap, because in everyday speech people say disinterested when they mean uninterested. Those are two different words, and uninterested is the one that means bored.

6. SUBJUGATE

(1)

A. ✓ **Liberate**

B. Oppress

C. Protest

D. Conquer

Answer: A

This item asks for the opposite. To subjugate a people is to bring them under control by force, so the reverse is to liberate them, to set them free. Oppress is the trap because it sits in the same harsh world as subjugate, but it means to keep people down, which is close in meaning rather than opposite.

7. PENNYWISE

(1)

A. Selfish

B. Pleasant

C. Ungrateful

D. ✓ **Extravagant**

Answer: D

Pennywise describes a person who is careful with small amounts of money, so the opposite is a person who spends freely, which is extravagant. Selfish is the trap because a very careful spender can look mean to other people, but selfish is about caring only for yourself and is not about how money is handled.

8. FRIENDLY

(1)

A. ✓ **Hostile**

B. Warm

C. Supportive

D. Affectionate

Answer: A

Warm, supportive and affectionate all say much the same thing as friendly, and an item where three options agree is asking for the opposite. Hostile, meaning unfriendly and ready to fight, is the one word that reverses it. Warm is the trap for anyone who reads the item as asking for the closest word instead.

9. Which word is different? (Apple, Carrot, Grape, Banana)

(1)

A. Apple

B. ✓ **Carrot**

C. Grape

D. Banana

Answer: B

Apple, grape and banana are fruits, which grow from the flower of a plant and carry its seeds. A carrot is a root pulled out of the ground, so it sits in a different group. Banana can look like the odd one because it is the only one you have to peel, but peeling is a habit of eating and not what the food is.

10. Which word is different? (London, Paris, New York, California)

(1)

A. London

B. Paris

C. New York

D. ✓ **California**

Answer: D

London, Paris and New York are cities. California is a state of the United States, a much larger unit that holds many cities inside it. New York is the trap because there is a New York state as well, but the group only holds together when New York is read as the city, which is the usual reading beside London and Paris.

11. Which word is different? (Lion, Tiger, Elephant, Leopard)

(1)

- A. Lion
- B. Tiger
- C. ✓ Elephant
- D. Leopard

Answer: C

Lion, tiger and leopard all belong to the cat family. An elephant is not a cat at all, so it is the odd one. Lion can tempt you because it is the only one of the three cats that lives in a group, but the item groups the animals by family, not by habit.

12. The engineer's meticulous attention to detail in the design of the building ensured that everything was perfectly executed, from the architecture to the finishing touches. (Underlined: meticulous)

- A. reckless
B. ✓ thorough
C. curious
D. imprecise

Answer: B

Meticulous describes work done with great care over every small part, which the sentence shows when it says everything was perfectly executed, from the architecture to the finishing touches. Thorough carries that same idea of leaving nothing out. Curious is the trap because both words suggest a mind that is engaged, but curious is about wanting to know things, not about care with detail.

13. As soon as all the indispensable forms have been filled out, we will process our applications. (Underlined: indispensable)

- A. ✓ requisite B. nonessential
C. tentative D. imprecise

Answer: A

Indispensable means you cannot do without it, so the forms have to be filled before the applications can move. Requisite means required, which matches. Nonessential is the trap because it carries a negative prefix as well and looks like a partner word, but it says the opposite: that the thing can be left out.

14. Ali is all the time gluttonous to explore a wide range of topics, seeking to learn more and never satisfied with just the basics. (Underlined: gluttonous)

- A. ✓ voracious B. excessive
C. limited D. disinterested

Answer: A

Gluttonous usually describes a huge appetite for food. Here it describes an appetite for learning, and voracious is the word that carries a large appetite in both senses. The sentence backs it up, since Ali seeks to learn more and is never satisfied. Excessive is the trap because gluttony suggests too much of something, but excessive only says an amount has gone past a limit and misses the hunger the sentence describes.

15. I've always been somewhat introverted, preferring to reflect quietly rather than engage in constant chatter with friends. (Underlined: introverted) (1)

- A. outgoing
B. ✓ reserved
C. indifferent
D. verbose

Answer: B

Introverted describes a person who keeps to themselves and prefers quiet, which the sentence spells out when it says the speaker prefers to reflect quietly rather than engage in constant chatter. Reserved says the same thing. Indifferent is the trap because a quiet person can look uncaring, but an introvert may care a great deal and still stay quiet.

16. She wanted to impress all her dinner guests with the food she served, so she carefully studied the necessary culinary arts. (Underlined: culinary)
- A. architectural B. literary
- C. ✓ cooking D. gardening

Answer: C

Culinary means to do with cooking and the kitchen. The sentence gives the context, since she wants to impress her dinner guests with the food she served. Literary is the trap because the phrase about studying the arts pulls the mind towards books, but what she studied was how to cook.

17. Correct sentence: Neither the players nor the manager be ready for the next press conference. (1)
- A. Neither the players nor the manager be ready for the next press conference.
- B. Neither the players nor the manager were ready for the next press conference.
- C. ✓ **Neither the players nor the manager is ready for the next press conference.**
- D. Neither the players nor the manager have been ready for the next press conference.

Answer: C

With neither and nor, the verb agrees with whichever subject stands nearer to it. The nearer subject here is the manager, which is singular, so the verb is is. Option B is the trap because players is plural and sits in the same sentence, but it is the far subject, so it does not decide the verb.

18. Correct sentence: I personally believe the team has played wonderful in the match. (1)
- A. I personally believe the team has played wonderful in the match.
- B. I personally believe the team have played wonderful in the match.
- C. ✓ **I personally believe the team has played wonderfully in the match.**
- D. I personally believe the team played wonderful in the match.

Answer: C

Wonderful is an adjective, so it can only describe a noun. What needs describing here is played, which is a verb, and a verb takes an adverb, so wonderfully is correct. Team is treated as one unit, which is why has fits with it. Option A is the trap because played wonderful is common in speech, but writing needs the adverb.

19. Correct sentence: Ali is one of the authorities who is responsible for the decision. (1)
- A. Ali is one of the authorities who is responsible for the decision.
- B. ✓ **Ali is one of the authorities who are responsible for the decision.**
- C. Ali is one of the authority who is responsible for the decision.
- D. Ali is one of the authority who are responsible for the decision.

Answer: B

The word who points back to the noun in front of it, authorities, which is plural, so the verb is are. The sense agrees: several authorities are responsible, and Ali is one of them. Option A is the trap because one is singular and feels like the subject, but one is not the word who refers to.

20. Keneni has to study four books (English, Physics, Chemistry and Biology) on four different days from Thursday to Sunday. The order of the books is as follows: Chemistry is studied on day before the day of English. Biology is studied on day after the day of Physics. (1)

Keneni has to study four books (English, Physics, Chemistry and Biology) on four different days from Thursday to Sunday. The order is: Chemistry is studied on day before the day of English. Biology is studied on day after the day of Physics. Which of the following is a correct order of books?

- A. Chemistry, Biology, English, Physics
B. Biology, Chemistry, English, Physics
C. ✓ **Physics, Chemistry, Biology, English**
D. English, Chemistry, Biology, Physics

Answer: C

Test each order against the two rules: Chemistry comes before English, and Biology comes after Physics. Option C runs Physics, Chemistry, Biology, English across Thursday to Sunday, so Chemistry on Friday is before English on Sunday, and Biology on Saturday is after Physics on Thursday. Both rules hold. Option A is the trap because it does place Chemistry before English, but it puts Biology second and Physics last, which breaks the second rule.

21. Same conditions. (1)

Which one of the following is NOT possible?

- A. Chemistry on Thursday
B. ✓ **Physics on Sunday**
C. Physics on Thursday
D. Biology on Saturday

Answer: B

Biology has to come after Physics, so Physics can never take the last day of the four. Sunday is the last day, so Physics on Sunday is impossible and B is the answer. Option D is the trap because Biology on Saturday sounds tight, but it works: Physics on Thursday, Chemistry on Friday, Biology on Saturday and English on Sunday keeps both rules.

22. After hearing about the new job opening in his field, Mark decided to apply immediately. Though it would mean moving to a new city, he was excited about the opportunity and felt it was a great career move. The job was also offering a higher salary than his current position, which made the decision easier for him. What is the most likely reason Mark decided to apply for the new job? (1)

- A. Mark enjoys living in his current city.
B. ✓ **Mark believes the new job is a better career opportunity.**
C. The new job requires him to relocate to a different country.
D. Mark prefers jobs that offer lower salaries.

Answer: B

The passage gives his reason directly: he was excited about the opportunity and felt it was a great career move. The higher salary comes next as a second thing that made the decision easier, so the career is the main reason. Option C is the trap because the passage does mention moving, but it says a new city, not a different country.

23. Meditation is a great way to enhance mental health and reduce stress, and you don't need a gym or special equipment to practice it. All you need is a quiet space, some time, and a comfortable place. Which of the following sentences best supports this idea? (1)

- A. **Meditation is a simple, cost-effective practice that only needs a peaceful space to improve mental clarity.**
B. Gym workouts are worse for stress relief than meditation because it needs a professional instructor.
C. Meditation requires special equipment like pillows or sound machines for effectiveness.
D. You don't need a quiet space, some time and comfortable position for meditation.

Answer: A

The idea being supported is that meditation helps mental health and costs nothing to set up, needing only a quiet space, some time and a comfortable place. Option A repeats exactly that. Option B is the trap because it sounds positive about meditation, but it brings in a comparison with gym workouts and a claim about a professional instructor that the passage never makes.

- 24.** *Mary Jonson was an obstinate and isolated child, who spent her early years in the lush landscapes of India. Following the death of her neglectful parents, she was sent to live with her reclusive uncle, Mr. Craven, in an enormous, deserted mansion in England. Initially, Mary was disinterested in her surroundings, sulking in her loneliness. However, a fateful discovery of a hidden door in the garden wall sparked her curiosity. As Mary ventured into the long-forgotten garden, she encountered a wild, untamed world filled with neglected flora. Driven by a newfound purpose, she diligently nurtured the garden back to life, transforming it into a sanctuary of vibrant colors and charming scents. Through this process, she not only fostered the garden's revival but also cultivated friendships that helped her discover the joys of companionship, resilience, and personal growth.*
- How is Mary Jonson initially characterized in the passage?

- A. ✓ **Stubborn and solitary**
B. Energetic and curious
C. Cheerful and sociable
D. Compassionate and friendly

Answer: A

The passage opens by calling Mary an obstinate and isolated child. Obstinate means stubborn and isolated means solitary, so option A restates those two words. Option B is the trap because Mary does become curious later, once she finds the hidden door, but the question asks how she is described at the start.

- 25.** *same passage* (1)
- What event led to Mary's relocation to her uncle's mansion?

- A. A family reunion
- B. Her desire for adventure
- C. ✓ **The death of her parents**
- D. A travel to England for vacation

Answer: C

The passage says that following the death of her neglectful parents she was sent to live with her uncle, so the death is what caused the move. Option D is the trap because she does end up in England, but the passage describes her being sent to a guardian, not travelling for a holiday.

- 26. same passage** (1)
- What does Mary find within the hidden garden?

- A. A magical fountain
- B. ✓ **An overgrown, neglected space**
- C. A place filled with animated animals
- D. A structured and organized landscape

Answer: B

The passage describes what she meets inside the garden as a wild, untamed world filled with neglected flora, which is an overgrown and neglected space. Option D is the trap because many English gardens are laid out in neat patterns, but this one had been forgotten for years and the passage says so.

27. *same passage* (1)
- What transformation occurs in Mary as she cares for the garden?

- D. ✓ She discovers feelings of companionship and resilience**

Answer: D

The last sentence says she cultivated friendships that helped her discover the joys of companionship, resilience and personal growth. That is a change inside Mary herself, which is what option D reports. Option B is the trap because she does work in the garden and must have picked up something about plants, but the passage puts the change in her, not in her skills.

28. *Every year, millions of monarch butterflies embark on an incredible migration from North America to central Mexico. This journey can span up to 3,000 miles, making it one of the longest migrations of any insect species. Monarchs travel in groups, known as clusters, and rely on specific environmental cues to guide them, such as temperature and the position of the sun. As they migrate, monarchs face numerous trials, including predators and changes in weather. They must find food sources, typically nectar from flowers, to sustain their journey. Interestingly, these butterflies are not born knowing the migration route; instead, it is believed they inherit the knowledge through instinct passed down from previous generations. Upon reaching their wintering grounds, the monarchs gather in vast numbers, covering the trees in a breathtaking display. This phenomenon not only underscores the resilience of the species but also highlights the importance of preserving their habitat. Protecting these migration pathways is crucial for the survival of monarchs, as environmental changes threaten their annual journey.*

(1)

What distinguishes the migration of monarch butterflies from those of other insect species?

- A. It happens only in small clusters.
- B. It relies solely on the position of the sun.
- C. It occurs without the need for food sources.
- D. ✓ **It spans up to 3,000 miles, making it one of the longest migrations.**

Answer: D

The passage says the journey can span up to 3,000 miles, making it one of the longest migrations of any insect species. That length is what sets the monarch apart. Option B is the trap because the sun is named as a guide, but temperature is named as well, so the word solely is wrong, and using the sun is not what makes the monarch unusual.

29. *same passage*

(1)

Which of the following best describes the challenges faced by monarch butterflies during migration?

- A. Lack of instinct on the migration route.
- B. Sufficient food supply and safe climates.
- C. Overpopulation at their wintering grounds.
- D. ✓ **Predators, adverse weather, and the search for nectar.**

Answer: D

The passage lists the trials as predators, changes in weather, and the need to find nectar to keep the journey going. Option D collects those three. Option A is the trap because the passage does say the butterflies are not born knowing the route, but it goes on to say the knowledge is inherited through instinct, so the route is not one of their problems.

30. *same passage*

(1)

In what way is the knowledge of the migration route significant for the monarch butterflies?

- A. It allows them to adapt to new climates.
- B. ✓ **It is vital for their survival during migration.**
- C. It enables them to find better feeding grounds.
- D. It guarantees the success of their breeding cycle.

Answer: B

The passage says the route is not learned in life but inherited through instinct from earlier generations, and it closes by saying that protecting the migration pathways is crucial for the survival of monarchs. Put together, the inherited route is what carries them through the journey alive. Option C is the trap because nectar is mentioned, but the route knowledge is about reaching the wintering grounds, and the passage never claims it finds better feeding places.

31. *same passage*

(1)

Based on the passage, what can be inferred about the role of environmental changes on the migration of monarch butterflies?

- A. Environmental changes have no significant impact on the migration of monarch butterflies.
- B. Monarch butterflies are capable of adapting their migration routes quickly in response to environmental changes.
- C. **The survival of monarch butterflies during their migration is at risk due to environmental changes, making habitat preservation essential.**
- D. Monarch butterflies rely solely on instinct for their migration and do not require external environmental cues.

Answer: C

The closing lines say that environmental changes threaten the annual journey and that protecting the migration pathways is crucial for survival. That is what option C states. Option B is the trap because the passage mentions cues such as temperature and the position of the sun, which can sound like flexibility, but it never says the butterflies can change route quickly.

32. The product of two numbers is 120 and the sum of their squares is 289. The sum of the numbers is?

(1)

- A. 20
- B. **✓ 23**
- C. 169
- D. 529

Answer: B

Use the square of a sum: $(x + y)^2 = x^2 + y^2 + 2xy$. Here $x^2 + y^2 = 289$ and $xy = 120$, so $(x + y)^2 = 289 + 240 = 529$ and $x + y = 23$. Option D is the trap because 529 is the square of the sum, while the question asks for the sum itself.

33. What is the value of X and Y respectively in a sequence 1, 5, 14, 30, 55, X, 140, 204, - - ?

(1)

- A. 85
- B. 86
- C. **✓ 91**
- D. 75

Answer: C

Look at the gaps between the terms: $5 - 1 = 4$, $14 - 5 = 9$, $30 - 14 = 16$ and $55 - 30 = 25$. The gaps are the square numbers $2^2, 3^2, 4^2, 5^2$, so the next gap is $6^2 = 36$ and $55 + 36 = 91$. It holds further along too, since $91 + 7^2 = 140$ and $140 + 8^2 = 204$. Option A is the trap because adding the previous term, $55 + 30$, gives 85, but the pattern lives in the gaps and not in the terms.

34. A library has an average of 510 visitors on Sundays and 240 on other days. The average number of visitors per day in a month of 30 days beginning with a Sunday is:

(1)

- A. 250
- B. 276
- C. 280
- D. **✓ 285**

Answer: D

A 30 day month that begins on a Sunday has Sundays on days 1, 8, 15, 22 and 29, so there are 5 Sundays and 25 other days. The total is $5 \times 510 + 25 \times 240 = 2550 + 6000 = 8550$ visitors. The daily average is $8550 \div 30 = 285$. Option B is the trap: counting only 4 Sundays gives $(4 \times 510 + 26 \times 240) \div 30 = 276$, so the day the month starts on decides the answer.

35. Which of the following linear inequalities define the domain of the function $f(x,y)=\sqrt{4x-y+6}+\ln(2x+y-5)$? (1)

A. ✓ $4x - y \geq -6$ and $2x + y > 5$

B. $4x - y \leq -6$ and $2x + y \geq 5$

C. $4x - y \geq -6$ and $2x + y \geq 5$

D. $4x - y \leq -6$ and $2x + y > 5$

Answer: A

Two conditions have to hold at once. A square root needs its inside to be zero or positive, so $4x - y + 6 \geq 0$, which is $4x - y \geq -6$. A logarithm needs its inside to be strictly positive, since $\ln 0$ has no value, so $2x + y - 5 > 0$, which is $2x + y > 5$. Option C is the trap because it treats the logarithm like the square root and allows equality, but zero is not allowed inside a logarithm.

36. Find an odd out from the given: 396, 427, 671, 264 (1)

A. 396

B. ✓ 427

C. 671

D. 264

Answer: B

Test the numbers for a shared factor. $396 = 11 \times 36$, $671 = 11 \times 61$ and $264 = 11 \times 24$, while $427 = 7 \times 61$ is not a multiple of 11. A fast check for a three digit multiple of 11 is that the outer digits add up to the middle digit: $3 + 6 = 9$, $6 + 1 = 7$ and $2 + 4 = 6$ all work, but $4 + 7 = 11$ is not 2. Option C is the trap because 671 is the largest of the four and looks unlike the rest, but size is not the rule being tested.

37. The White, Red and Black balls in a packet are in the ratio of 5:3:2. How many Red and Black balls are there, if there are 40 White balls? (1)

A. 30 reds and 50 black balls

B. 16 reds and 24 black balls

C. ✓ 24 reds and 16 black balls

D. 25 reds and 15 black balls

Answer: C

The ratio 5:3:2 means the balls come in parts, and white takes 5 of them. With 40 white balls, one part is $40 \div 5 = 8$ balls. Red takes 3 parts, so $3 \times 8 = 24$, and black takes 2 parts, so $2 \times 8 = 16$. Option B is the trap because it holds the right two numbers with red and black swapped, and red has the bigger share of the ratio.

38. If $2a + b = x$ and $-2a + b = y$, then which one of the following expression is equal to ab ? (1)

A. $(x+y)/2$

B. $(x-y)/4$

C. ✓ $(x^2 - y^2)/8$

D. $(x^2 + y^2)/8$

Answer: C

Use the difference of two squares: $x^2 - y^2 = (x + y)(x - y)$. Here $x + y = (2a + b) + (-2a + b) = 2b$ and $x - y = (2a + b) - (-2a + b) = 4a$, so $x^2 - y^2 = 8ab$ and $ab = \frac{x^2 - y^2}{8}$. Option B is the trap because $\frac{x-y}{4} = \frac{4a}{4} = a$, which gives a on its own and not the product.

39. The average monthly income of P and Q is Birr 5050. The average monthly income of Q and R is 6250 and the average of P and R is 5200. The monthly income of P is: (1)

A. 3500

B. ✓ 4000

C. 4050

D. 5000

Answer: B

Each figure given is an average of two people, so double it to get a total: $P + Q = 10100$, $Q + R = 12500$ and $P + R = 10400$. Adding the three totals counts every person twice, so $2(P + Q + R) = 33000$ and $P + Q + R = 16500$. Then $P = 16500 - 12500 = 4000$ Birr. Option C sits close to the answer and catches a slip in the addition, so check that $10100 + 12500 + 10400 = 33000$.

A prime number has no factors except 1 and itself. Any even number bigger than 2 has 2 as a factor, so it cannot be prime. That leaves 2 as the only even prime anywhere in the list, so 1 number out of 100 works and the probability is $\frac{1}{100}$. Option D is the trap for anyone who expects a second even prime further up the list, but every even number after 2 is ruled out by the same argument.

45. A committee consists of 6 men and 4 women. If two members are selected at random to form a subcommittee. (1)
What is the probability that both members are women?
- A. $1/5$ B. ✓ $2/15$
C. $3/10$ D. $1/10$

Answer: B

Count the pairs instead of guessing. Two women can be chosen from four in $\binom{4}{2} = 6$ ways, and two people from ten in $\binom{10}{2} = 45$ ways, so the probability is $\frac{6}{45} = \frac{2}{15}$. Working step by step agrees: $\frac{4}{10} \times \frac{3}{9} = \frac{2}{15}$. Option A is the trap because $\frac{4}{10}$ is the chance that the first person picked is a woman and $1/5$ looks like a tidy version of that, but the question asks about both members, and the second pick comes from the 9 people left.

46. If average age of husband, wife and their child 3 years ago was 27 years and that of wife and child 5 years ago (1)
was 20 years. The present age of the husband is:
- A. 35 years B. ✓ 40 years
C. 50 years D. 90

Answer: B

Three years ago the three of them averaged 27, so their ages added to $3 \times 27 = 81$. Every one of them is 3 years older now, so today the three ages add to $81 + 9 = 90$. Five years ago the wife and child added to $2 \times 20 = 40$, so today they add to $40 + 10 = 50$. The husband is $90 - 50 = 40$ years old. Option C is the trap because 50 is the wife and child together today, not the husband.

47. $(287)^2 + (269)^2 - 2(287 \times 269)$ is equal to: (1)
- A. 534 B. 446
C. 354 D. ✓ 324

Answer: D

The shape $a^2 - 2ab + b^2$ is $(a - b)^2$. With $a = 287$ and $b = 269$, the difference is $287 - 269 = 18$, so the value is $18^2 = 324$. There is no need to square the large numbers at all. Option C sits close to the answer and catches a slip in that subtraction, so check the difference twice, since the whole question rests on it.

48. A piece of machinery is worth Birr 100,000 today and loses 25% of its value each year. How much will it be (1)
worth after 4 years?
- A. 75000 B. 41640.625
C. 31642 D. ✓ 31640.625

Answer: D

Losing 25% of the value each year means keeping 75% each year, so multiply by 0.75 four times: 100000×0.75^4 . Since $0.75^4 = 0.31640625$, the machine is worth 31640.625 Birr. Option A is the trap because taking 25% off once gives 75000, but the loss happens in each of the four years, and each year it is taken from a smaller value than the year before.

49. For x is a real number, compare Quantity A = $\sqrt{4x^2 + 4x + 1}$ and Quantity B = $2x + 1$. (1)
- A. Quantity A is less than quantity B B. Quantity A is greater than quantity B
C. Quantity A is equal to quantity B D. ✓ The relationship cannot determine

Answer: D

First tidy the root: $4x^2 + 4x + 1 = (2x + 1)^2$, so Quantity A is $\sqrt{(2x + 1)^2} = |2x + 1|$. When $x \geq -\frac{1}{2}$, the value $2x + 1$ is zero or positive and the two quantities are equal. When $x < -\frac{1}{2}$, $2x + 1$ is negative while Quantity A stays positive, so A is the greater one. Two different outcomes are possible, so no fixed relationship holds. Option C is the trap because a square root does undo a square, but it always hands back the positive value, and $2x + 1$ is not always positive.

50. Compare the two quantities: Quantity A = percent of income increase from 75 to 85 thousand birr; Quantity B = percent of income increase from 200 to 220 thousand birr. (1)
- A. Quantity A is equal to quantity B
B. ✓ Quantity A is greater than quantity B
C. Quantity A is less than quantity B
D. The relationship cannot determine

Answer: B

A percentage increase is the rise divided by the value it started from. Quantity A is $\frac{85-75}{75} = \frac{10}{75} = 13.3\%$. Quantity B is $\frac{220-200}{200} = \frac{20}{200} = 10\%$. So Quantity A is greater. Option C is the trap for anyone who compares the raw rises, 10 against 20, but a percentage always measures the rise against the base it came from.

51. The table below shows the sales of computers manufactured by a company over the years. Number of Different Types of Computer Sold by a Company over the Years (Numbers in Thousands) (1)

Year	4hp	7hp	32hp	35hp	55hp	Total
2000	75	144	114	102	108	543
2001	90	126	102	84	126	528
2002	96	114	75	105	135	525
2003	105	90	150	90	75	510
2004	90	75	135	75	90	465
2005	105	60	165	45	120	495
2006	115	85	160	100	145	605

What was the approximate percentage increase in the sales of 55hp computer in 2006 compared to that in 2000?

- A. 28%
B. 31%
C. 33.26%
D. ✓ 34.26%

Answer: D

The 55hp column shows 108 thousand in 2000 and 145 thousand in 2006. The rise is $145 - 108 = 37$, and a percentage increase is measured against the earlier year: $\frac{37}{108} = 0.3426$, which is 34.26%. Option C is a near miss placed there for anyone who rounds early, so carry the division to two decimal places before choosing.

52. same table (1)
Which type of computers sales is maximum over seven years?

- A. 4hp
B. 7hp
C. ✓ 32hp
D. 35hp

Answer: C

Add each column across the seven years. 4hp totals 676, 7hp totals 694, 32hp totals 901, 35hp totals 601 and 55hp totals 799, all in thousands. The largest is 32hp with 901. Option B is the trap because 7hp starts highest in 2000 with 144, so reading only the first row points at it, but the 7hp figures fall away year after year.

53. same table (1)
What is the difference in the number of 35hp computers sold in 2001 and 2005?

- A. 24000
B. 28000
C. 35000
D. ✓ 39000

Answer: D

Read down the 35hp column: 84 thousand in 2001 and 45 thousand in 2005. The difference is $84 - 45 = 39$ thousand, and the heading says the table is written in thousands, so the answer is 39000 computers. Option C is the trap as a rounder looking figure, but the two entries in the table give 39 thousand exactly.

54. same table

(1)

Which types of computer was a continuous decrease in sales from 2000 to 2005?

- A. 4hp
B. ✓ 7hp
C. 32hp
D. 35hp

Answer: B

Follow each column from 2000 to 2005 and look for one that never rises. 7hp runs 144, 126, 114, 90, 75, 60, falling in every single year. Option D is the trap because 35hp does fall in most of those years, but it goes from 84 in 2001 up to 105 in 2002, which breaks the run.

55. same table

(1)

The percentage of 4hp computer sold to the total number of computer sold was maximum in the year?

- A. 2002
B. 2004
C. 2003
D. ✓ 2005

Answer: D

Work out the 4hp share of each year's total. 2002 gives $\frac{96}{525} = 18.3\%$, 2003 gives $\frac{105}{510} = 20.6\%$, 2004 gives $\frac{90}{465} = 19.4\%$ and 2005 gives $\frac{105}{495} = 21.2\%$. The highest share is 2005. Option C is the trap because 2003 sold the same 105 thousand 4hp machines, but that year's total was larger, 510 against 495, so the same sales make a smaller share.

END OF THE MARKING KEY

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