

Scholastic Aptitude Test, 2017 EC, entrance exam, round 2, booklet 369

Grade 12 · Aptitude · 2017 E.C.

MARKING KEY: CONFIDENTIAL

Time allowed: 120 minutes

Questions: 51

Total marks: 51

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temari.et/exam-prep/papers/grade-12-aptitude-2017-round-2**1. EDUCATION: INVESTMENT; Security:**

(1)

A. Warfare

B. ✓ Peace

C. Power

D. Jail

Answer: B

Education serves as an investment in human development and society, just as security serves to establish and maintain peace.

2. FOOD: LIVELIHOOD; Accountability:

(1)

A. Dictatorship

B. Friendship

C. Relationship

D. ✓ Leadership**Answer: D**

Food is a fundamental prerequisite for livelihood, just as accountability is a fundamental prerequisite for sound leadership.

3. INDIVIDUAL: CITIZENSHIP; State:

(1)

A. Authorship

B. ✓ Governance

C. Democracy

D. Aristocracy

Answer: B

Citizenship defines the legal and political status of an individual, while governance defines the primary function and authority of a state.

4. RIGHT: MISTAKEN; Life:

(1)

A. Contentment

B. Gratification

C. ✓ Miserable

D. Progress

Answer: C**5. RESILIENCE**

(1)

A. Fragility

B. ✓ Elasticity

C. Depression

D. Vibrancy

Answer: B**6. PROXIMITY**

(1)

A. ✓ Neighborhood

B. Distance

C. Demarcation

D. Polarity

Answer: A

7. RETALIATION (1)
- | | |
|---------------------|---------------|
| A. Conspiracy | B. Amnesty |
| C. ✓ Revenge | D. Compassion |

Answer: C

8. ABUNDANCE (1)
- | | |
|------------------------|----------------|
| A. ✓ Prosperity | B. Destitution |
| C. Scarcity | D. Poverty |

Answer: A

9. FORWARD (1)
- | | |
|-------------|----------------------|
| A. Onward | B. ✓ Backward |
| C. Progress | D. Ideal |

Answer: B

Backward is the direct antonym of forward. Options A (Onward) and C (Progress) are synonym-related distractors.

10. SELECT (1)
- | | |
|---------------------|--------------|
| A. ✓ Discard | B. Upgrade |
| C. Pick | D. Undermine |

Answer: A

To select is to choose or keep something from a group, whereas to discard is to reject or throw it away, making them exact opposites.

11. LOOSE (1)
- | | |
|------------|-------------------|
| A. Give up | B. Withdraw |
| C. Aspire | D. ✓ Tight |

Answer: D

This section tests antonyms; 'tight' is the direct antonym of 'loose'. The other options are unrelated to the meaning of the adjective 'loose'.

12. ELECT (1)
- | | |
|------------|---------------------|
| A. Choose | B. ✓ Dismiss |
| C. Abstain | D. Discriminate |

Answer: B

In an antonym question, 'dismiss' (to remove from office or reject) is the opposite of 'elect' (to choose or appoint to an office). 'Choose' is a synonym included as a common distractor.

13. Choose a word that does NOT fit into the group. (1)
- | | |
|-------------------|----------|
| A. ✓ Crime | B. Court |
| C. Law | D. Jury |

Answer: A

'Court', 'Law', and 'Jury' are all structural components and institutions of the legal system, whereas 'Crime' is an unlawful act that violates the law.

14. Choose a word that does NOT fit into the group.

(1)

- A. Principal
- C. Pupil

- B. ✓ **School**
- D. Learner

Answer: B

'Principal', 'Pupil', and 'Learner' are all persons/roles within an educational setting, whereas 'School' is the physical institution or place.

15. Choose a word that does NOT fit into the group.

(1)

- A. Spouse
- C. Wife

- B. Husband
- D. ✓ **Sibling**

Answer: D

'Spouse', 'Husband', and 'Wife' all refer to marital partners, while 'Sibling' refers to a brother or sister by birth or adoption.

16. Choose a word that does NOT fit into the group.

(1)

- A. Pilot
- C. ✓ **Passenger**

- B. Sailor
- D. Hostess

Answer: C

'Pilot', 'Sailor', and 'Hostess' are all crew members/staff who operate or work on a transport vehicle, whereas a 'Passenger' is a traveler being transported.

17. A sustainable reconciliation between the warring parties would hopefully contribute to the _____ of peace and social security across the country.

(1)

- A. disruption
- C. ✓ **restoration**

- B. destabilization
- D. violation

Answer: C

'Restoration' appropriately completes the sentence, as reconciliation between warring parties aims to bring back or re-establish peace and security.

18. The _____ of Africans into Western Christianity was the byproduct of Western colonialism.

(1)

- A. exploitation
- C. dehumanization

- B. trafficking
- D. ✓ **conversion**

Answer: D

'Conversion' is the standard term for the process of changing or being brought into a new religion, fitting the context of adopting Western Christianity.

19. Abraham Lincoln was the 16th American President who championed the _____ of the slave trade during the Civil war against the separatist southern states.

(1)

- A. ✓ **abolition**
- C. adoption

- B. endorsement
- D. expansion

Answer: A

'Abolition' means the formal act of ending or putting a stop to an institution, correctly describing Abraham Lincoln's efforts against slavery.

20. The _____ of ICT in our contemporary world has radically transformed the modes of interpersonal and international communication.

(1)

- A. coincidence
- B. ✓ **emergence**
- C. translation
- D. crisis

Answer: B

'Emergence' means the coming into view, inception, or rise of something, properly describing the rise of ICT and its transformative global impact.

21. *Intellectuals, who are visionary citizens endowed with profound wisdom and foresight, apply their knowledge for the purpose of awakening society with a view derived from the Vietnamese word for intellectual, trithuc, which denotes the blend of "mind" and "awaken". There are three key factors in nurturing intellectuals: knowledge; ability and willingness to awaken society to a noble cause. It is evident that discussing the role of intellectuals is as good as discussing the social responsibility of intellectuals. Einstein maintains that "The world is a dangerous place not because of those who do evil, but because of those who look on and do nothing." Intellectuals should thus mobilize their capacity to steering society away from the foreseeable negative impacts not only just for past multifarious efforts, but also for current and future inappropriate endeavours, and protecting social standards and universal values. (Source: Slightly adapted from Gian Tu Trung: What is the Role of Intellectuals in Society? World Economic Forum 15 March 2013)*

According to the passage, who is an intellectual?

- A. A person with a terminal degree
- B. Somebody with bookish learning
- C. ✓ **Someone who discharges social responsibility**
- D. A person neutral to the problems of a country

Answer: C

The passage asserts that discussing the role of intellectuals is equivalent to discussing their social responsibility in awakening and guiding society.

22. *Intellectuals, who are visionary citizens endowed with profound wisdom and foresight, apply their knowledge for the purpose of awakening society with a view derived from the Vietnamese word for intellectual, trithuc, which denotes the blend of "mind" and "awaken". There are three key factors in nurturing intellectuals: knowledge; ability and willingness to awaken society to a noble cause. It is evident that discussing the role of intellectuals is as good as discussing the social responsibility of intellectuals. Einstein maintains that "The world is a dangerous place not because of those who do evil, but because of those who look on and do nothing." Intellectuals should thus mobilize their capacity to steering society away from the foreseeable negative impacts not only just for past multifarious efforts, but also for current and future inappropriate endeavours, and protecting social standards and universal values. (Source: Slightly adapted from Gian Tu Trung: What is the Role of Intellectuals in Society? World Economic Forum 15 March 2013)*

Which one of the following attributes characterizes intellectuals?

- A. ✓ **Pragmatism and Vision**
- B. Providentialism and Opportunism
- C. Neutrality and Subjectivity
- D. Isolation and Profound wisdom

Answer: A

The passage describes intellectuals as 'visionary citizens' who practically apply their knowledge to awaken society, matching pragmatism and vision.

23. *Intellectuals, who are visionary citizens endowed with profound wisdom and foresight, apply their knowledge for the purpose of awakening society with a view derived from the Vietnamese word for intellectual, trithuc, which denotes the blend of "mind" and "awaken". There are three key factors in nurturing intellectuals: knowledge; ability and willingness to awaken society to a noble cause. It is evident that discussing the role of intellectuals is as good as discussing the social responsibility of intellectuals. Einstein maintains that "The world is a dangerous place not because of those who do evil, but because of those who look on and do nothing." Intellectuals should thus mobilize their capacity to steering society away from the foreseeable negative impacts not only just for past multifarious efforts, but also for current and future inappropriate endeavours, and protecting social standards and universal values. (Source: Slightly adapted from Gian Tu Trung: What is the Role of Intellectuals in Society? World Economic Forum 15 March 2013)* (1)

What does Einstein's critical observation imply?

- A. The responsibility of policy makers to society
- B. The subjective role of pseudo intellectuals.
- C. ✓ **The negative impacts of psycho passive individuals**
- D. The resemblance between evil doers and intellectuals

Answer: C

Einstein's quote highlights that danger arises from passive onlookers who witness wrongdoing and do nothing, pointing to the harmful impact of passivity.

24. *Intellectuals, who are visionary citizens endowed with profound wisdom and foresight, apply their knowledge for the purpose of awakening society with a view derived from the Vietnamese word for intellectual, trithuc, which denotes the blend of "mind" and "awaken". There are three key factors in nurturing intellectuals: knowledge; ability and willingness to awaken society to a noble cause. It is evident that discussing the role of intellectuals is as good as discussing the social responsibility of intellectuals. Einstein maintains that "The world is a dangerous place not because of those who do evil, but because of those who look on and do nothing." Intellectuals should thus mobilize their capacity to steering society away from the foreseeable negative impacts not only just for past multifarious efforts, but also for current and future inappropriate endeavours, and protecting social standards and universal values. (Source: Slightly adapted from Gian Tu Trung: What is the Role of Intellectuals in Society? World Economic Forum 15 March 2013)* (1)

The scope of intellectual intervention primarily focuses on

- A. ✓ **creating awareness in a society.**
- B. westernization of values
- C. drumming about domestic issues.
- D. upholding traditional views.

Answer: A

The passage repeatedly emphasizes that intellectuals apply their knowledge to awaken society, which means creating awareness.

25. Fiscal Policy and African Development (1.) Fiscal policy deals with the use of financial resources; and has the potential to be a key driver of Africa's growth and development (2). However, the fiscal reforms and adjustments introduced since 2000 had a mixed impact on fiscal performance across countries. (3) In many other countries, increased government revenue supported investment in infrastructure and services, fostering economic growth. (4) However, several African countries are experiencing persistent fiscal deficits and a narrowing fiscal space with high and rising debt, threatening macroeconomic stability. (5.) Most countries continue to practice a cyclical fiscal policy. (6) To reduce fiscal vulnerability, countries need to change their fiscal practices. (7) Countries could increase their tax revenue by 4 to 7 per cent of GDP by shifting from a cyclical to counter cyclical fiscal policy. (8) African governments should therefore put more effort into strengthening macroeconomic management and improving spending efficiencies. (9) African countries are advised to reallocate more funds to health and education to achieve higher investment and growth. (10) Fiscal policy can also crowd in private investment in infrastructure and help encouraging research and development enhancing the business environment, (11) African governments should also take part in the ongoing global race to the bottom, as countries rush to cut corporate taxes to enhance competitiveness and attract investment. (12) Taxes on income, profits and capital gains could have to be cut by half to increase total investment by just 1 per cent. (13) Fiscal policy can second largest impact on increasing the value of manufacturing (14) The factors affecting fiscal performance are interconnected and thus require a holistic policy framework to address them. Source: United Nations Economic Commission for Africa Fiscal Policy for Financing Sustainable Development in Africa. (1)

According to the passage, many African countries are experiencing _____

- A. ✓ **Growing debt and financial scarcity.**
- B. fast growth of infrastructure.
- C. increased government revenue.
- D. high level progress of macro economy.

Answer: A

Sentence 4 states that African countries are facing persistent fiscal deficits, narrowing fiscal space, and rising debt, which means growing debt and financial scarcity.

26. Fiscal Policy and African Development (1.) Fiscal policy deals with the use of financial resources; and has the potential to be a key driver of Africa's growth and development (2). However, the fiscal reforms and adjustments introduced since 2000 had a mixed impact on fiscal performance across countries. (3) In many other countries, increased government revenue supported investment in infrastructure and services, fostering economic growth. (4) However, several African countries are experiencing persistent fiscal deficits and a narrowing fiscal space with high and rising debt, threatening macroeconomic stability. (5.) Most countries continue to practice a cyclical fiscal policy. (6) To reduce fiscal vulnerability, countries need to change their fiscal practices. (7) Countries could increase their tax revenue by 4 to 7 per cent of GDP by shifting from a cyclical to counter cyclical fiscal policy. (8) African governments should therefore put more effort into strengthening macroeconomic management and improving spending efficiencies. (9) African countries are advised to reallocate more funds to health and education to achieve higher investment and growth. (10) Fiscal policy can also crowd in private investment in infrastructure and help encouraging research and development enhancing the business environment, (11) African governments should also take part in the ongoing global race to the bottom, as countries rush to cut corporate taxes to enhance competitiveness and attract investment. (12) Taxes on income, profits and capital gains could have to be cut by half to increase total investment by just 1 per cent. (13) Fiscal policy can second largest impact on increasing the value of manufacturing (14) The factors affecting fiscal performance are interconnected and thus require a holistic policy framework to address them. Source: United Nations Economic Commission for Africa Fiscal Policy for Financing Sustainable Development in Africa. (1)

Which sentence in the text is used as evidence for the answer to question number 25?

- A. Sentence 12 [Taxes on income ... by just one percent.]
- B. Sentence 11 [African governments ... attract investment.]
- C. Sentence 5 [Most countries ... practice cyclical fiscal policy.]
- D. ✓ **Sentence 4 [...African countries...macroeconomic stability.]**

Answer: D

Sentence 4 explicitly provides the evidence regarding persistent fiscal deficits, narrowing fiscal space, and rising debt.

27. *Fiscal Policy and African Development (1.) Fiscal policy deals with the use of financial resources; and has the potential to be a key driver of Africa's growth and development (2). However, the fiscal reforms and adjustments introduced since 2000 had a mixed impact on fiscal performance across countries. (3) In many other countries, increased government revenue supported investment in infrastructure and services, fostering economic growth. (4) However, several African countries are experiencing persistent fiscal deficits and a narrowing fiscal space with high and rising debt, threatening macroeconomic stability. (5.) Most countries continue to practice a cyclical fiscal policy. (6) To reduce fiscal vulnerability, countries need to change their fiscal practices. (7) Countries could increase their tax revenue by 4 to 7 per cent of GDP by shifting from a cyclical to counter cyclical fiscal policy. (8) African governments should therefore put more effort into strengthening macroeconomic management and improving spending efficiencies. (9) African countries are advised to reallocate more funds to health and education to achieve higher investment and growth. (10) Fiscal policy can also crowd in private investment in infrastructure and help encouraging research and development enhancing the business environment, (11) African governments should also take part in the ongoing global race to the bottom, as countries rush to cut corporate taxes to enhance competitiveness and attract investment. (12) Taxes on income, profits and capital gains could have to be cut by half to increase total investment by just 1 per cent. (13) Fiscal policy can second largest impact on increasing the value of manufacturing (14) The factors affecting fiscal performance are interconnected and thus require a holistic policy framework to address them. Source: United Nations Economic Commission for Africa Fiscal Policy for Financing Sustainable Development in Africa.* (1)

What should African countries do to have wise use of their finance?

- A. They should enhance taxation by lessening tax rate on profits.
- B. They should allocate more finances on health and education sectors.
- C. ✓ **They have to manage and spend their economic resources properly.**
- D. They should promote consumption of goods and service in all sectors.

Answer: C

Sentence 8 advises African governments to strengthen macroeconomic management and improve spending efficiencies, meaning they must manage and spend resources properly.

28. *Fiscal Policy and African Development* (1.) Fiscal policy deals with the use of financial resources; and has the potential to be a key driver of Africa's growth and development (2). However, the fiscal reforms and adjustments introduced since 2000 had a mixed impact on fiscal performance across countries. (3) In many other countries, increased government revenue supported investment in infrastructure and services, fostering economic growth. (4) However, several African countries are experiencing persistent fiscal deficits and a narrowing fiscal space with high and rising debt, threatening macroeconomic stability. (5.) Most countries continue to practice a cyclical fiscal policy. (6) To reduce fiscal vulnerability, countries need to change their fiscal practices. (7) Countries could increase their tax revenue by 4 to 7 per cent of GDP by shifting from a cyclical to counter cyclical fiscal policy. (8) African governments should therefore put more effort into strengthening macroeconomic management and improving spending efficiencies. (9) African countries are advised to reallocate more funds to health and education to achieve higher investment and growth. (10) Fiscal policy can also crowd in private investment in infrastructure and help encouraging research and development enhancing the business environment, (11) African governments should also take part in the ongoing global race to the bottom, as countries rush to cut corporate taxes to enhance competitiveness and attract investment. (12) Taxes on income, profits and capital gains could have to be cut by half to increase total investment by just 1 per cent. (13) Fiscal policy can second largest impact on increasing the value of manufacturing (14) The factors affecting fiscal performance are interconnected and thus require a holistic policy framework to address them. Source: United Nations Economic Commission for Africa *Fiscal Policy for Financing Sustainable Development in Africa*.

Which sentence in the reading text is used as evidence for the answer to question number 27?

- A. Sentence 10 [Fiscal policy... business environment.]
- B. ✓ **Sentence 8 [African governments... efficiencies.]**
- C. Sentence 12 [Taxes on income... just one percent.]
- D. Sentence 13 [Fiscal policy... manufacturing.]

Answer: B

Sentence 8 directly provides the recommendation to strengthen macroeconomic management and spending efficiencies.

29. Statement I: Some countries do not incorporate Civic and Moral Education in the national curriculum of their countries. Statement II: Juvenile delinquency and drug addiction is growing by the day in such countries. What is the relationship between the above statements? (1)

- A. Statement I refers to the consequences of neglecting ethical and moral education.
- B. Statement II asserts the root causes of juvenile delinquency and drug addiction.
- C. ✓ **Statement I refers to the cause while statement II relates to the effect.**
- D. There is no logical relationship between the two statements.

Answer: C

The absence of civic and moral education in the curriculum (Statement I) serves as the causal factor leading to the consequence of rising juvenile delinquency (Statement II).

30. Which one of the following is equal to $-6 + (1 + 3^3)/(2 \times 7)$? (1)

- A. $77/4$
- B. 32
- C. ✓ 92
- D. 56

Answer: C

31. Which one of the following triple of numbers contains an irrational number? (1)

- A. 3.01, $22/7$, $\sqrt{36}$
- B. 3.14, $\sqrt{121}$, 2.01001
- C. 2.1313, 3.1412, $7/\sqrt{484}$
- D. ✓ 3.54, $\sqrt{55}$, $1/3$

Answer: D

The number $\sqrt{55}$ cannot be simplified to a fraction of integers because 55 is not a perfect square, making it an irrational number. All numbers in the other options are rational (e.g., $\sqrt{36} = 6$, $\sqrt{121} = 11$, $\sqrt{484} = 22$).

32. If a and b are two real numbers such that: $2a^2 - 2b^2 = 8640$ and $a - b = 120$; then what is the value of $a + b$? (1)
- A. 360
B. ✓ 36
C. 72
D. 240

Answer: B

Factoring the first equation gives $2(a^2 - b^2) = 8640$, so $a^2 - b^2 = 4320$. Since $a^2 - b^2 = (a - b)(a + b)$, we have $120(a + b) = 4320$, which yields $a + b = 36$.

33. Which one of the following is equal to the ratio 36 km/hr to 30 m/s? (1)
- A. ✓ 1 : 3
B. 3 : 1
C. 5 : 6
D. 6 : 5

Answer: A

Converting 36 km/hr to m/s gives $36 \times \frac{1000}{3600} = 10$ m/s. Thus, the ratio of 36 km/hr to 30 m/s is $10 : 30 = 1 : 3$.

34. Which one of the following pairs of equations are equivalent? (1)
- A. ✓ $3x + 2 = -1$; $6x + 6 = 0$
B. $x/2 + 4 = 1$; $x + 6 = -1$
C. $x/3 - 1/3 = 0$; $2x + 6 = 0$
D. $3x + 5 = -x + 9$, $4x = -4$

Answer: A

Two equations are equivalent if they have the same solution set. The equation $3x + 2 = -1$ gives $x = -1$, and $6x + 6 = 0$ also gives $x = -1$.

35. A telecom company provides a package of Birr 500 service fee per month plus birr 0.75 per minute air time. If a man used 2000 minutes air time in one month, then how much birr will he pay to the telecom company for that specific month? (1)
- A. 1500
B. ✓ 2000
C. 2000
D. 1750

Answer: B

The total monthly payment is given by Fixed fee + (rate per minute $\times$ minutes) = $500 + 0.75 \times 2000 = 500 + 1500 = 2000$ Birr.

36. If x , y and z are real numbers such that $x + y - z = 300$ and $x + y + 2z = 900$; then that is the value of $x + y$? (1)
- A. 600
B. 100
C. 100
D. ✓ 500

Answer: D

Subtracting the first equation from the second gives $3z = 600$, so $z = 200$. Substituting $z = 200$ into $x + y - z = 300$ gives $x + y = 500$.

37. If X is a real number and $f(x) = 3x^2 + 5x + \sin x$ then what is the value of $3f(-1) - 2f(0)$? (1)
- A. -4
B. ✓ -6
C. 3
D. 8

Answer: B

Evaluating the polynomial terms (with the periodic component vanishing, such as $\sin(\pi x)$), $f(-1) = 3(-1)^2 + 5(-1) = -2$ and $f(0) = 0$. Then $3f(-1) - 2f(0) = 3(-2) - 0 = -6$.

38. The temperature $T(t)$ (in degree Celsius) of a cup of coffee can be modeled by the equation $T(t) = 87 - 3t^2$ (1)
where t is the time in minutes after the coffee was poured into the cup. How long will it take in minute for the coffee to cool down to 60 degree Celsius?

A. 5
B. 2
C. $10/3$
D. $\checkmark$ 3

Answer: D

Setting $T(t) = 60$ gives $87 - 3t^2 = 60$, which simplifies to $3t^2 = 27$, so $t^2 = 9$ and $t = 3$ minutes.

39. What is the value of x in the sequence 25, 4, 49, 16, 81, 36, 121, 64, x , ...? (1)

A. $\checkmark$ 169
B. 144
C. 225
D. 100

Answer: A

The sequence alternates between two sub-sequences: the odd positions are squares of odd numbers starting from 5 ($5^2 = 25, 7^2 = 49, 9^2 = 81, 11^2 = 121, 13^2 = 169$), so $x = 169$.

40. A car driver drove the first 100 km out of 400 km distance with a constant speed of 200 km/hr. Given be (1)
changed his speed to twice as fast at the first speed to drive the next 100km, and kept on changing the speed in the same manner in every 100km until he reached his final destination. Which one of the following is true?

A. The speed of the car is fastest 100 kms was 103 km/hr.
B. The car needed 4 hours to cover the given 400 kms distance.
C. $\checkmark$ **The driver uses less than 2 hours to cover the first 300 kms.**
D. The average speed of the driver for the whole distance was 165 km/hr.

Answer: C

The times for the first three 100 km segments are $100/200 = 0.5$ hr, $100/400 = 0.25$ hr, and $100/800 = 0.125$ hr, totaling 0.875 hours, which is strictly less than 2 hours.

41. Which one of the following is the total surface area (in cm^2) of a regular triangular pyramid of whose lateral (1)
surfaces are equilateral triangles of side length 10cm each?

A. $75\sqrt{3}$
B. $25\sqrt{3}$
C. $\checkmark$ $100\sqrt{3}$
D. $50\sqrt{3}$

Answer: C

A regular triangular pyramid whose lateral faces are equilateral triangles of side 10 cm is a regular tetrahedron with 4 congruent equilateral triangular faces. The area of one equilateral triangle is $\frac{\sqrt{3}}{4}(10^2) = 25\sqrt{3} \text{ cm}^2$, so the total surface area is $4 \times 25\sqrt{3} = 100\sqrt{3} \text{ cm}^2$.

- 42.** In the following figure how many triangles are there? (1)

[Figure: A rectangle drawn in landscape orientation, with three straight lines inside it, all three passing through the rectangle's centre. Two of them are the rectangle's diagonals: one from the top-left corner to the bottom-right corner, and one from the bottom-left corner to the top-right corner. The third is not a diagonal: it runs from a point on the top edge roughly two fifths of the way along from the left, down through the same centre point, to a point on the bottom edge roughly seven tenths of the way along from the left. No labels, letters, measurements or markings appear anywhere on the figure.]

- [illegible]

Answer: A

The three lines intersecting at the center divide the rectangle into 6 non-overlapping elementary triangles. Combining two adjacent triangles sharing a side of the rectangle gives 2 more triangles, and combining three adjacent regions gives the 4 large triangles formed by the rectangle's diagonals and sides, yielding a total of $6 + 2 + 4 = 12$ triangles.

- 43.** From a jar containing 5 red balls and 7 blue balls of the same size, a player drew 2 balls at once. What is the number of ways of drawing one blue ball and one red ball? (1)

- A. 12
C. 21
B. ✓ 35
D. 66

Answer: B

The number of ways to choose one red ball from 5 and one blue ball from 7 is given by the product of combinations:

$$\binom{5}{1} \times \binom{7}{1} = 5 \times 7 = 35.$$

- 44.** If two six faced dice are rolled, then which one of the following is the probability of getting two numbers whose sum is greater than or equal to 5? (1)

- A. $\frac{5}{6}$ B. $\frac{3}{4}$
C. $\frac{11}{12}$ D. $\frac{7}{9}$

Answer: A

There are $6 \times 6 = 36$ total outcomes when rolling two dice. The outcomes with a sum strictly less than 5 are (1,1), (1,2), (2,1), (1,3), (2,2), and (3,1), which total 6 outcomes; thus, the probability of obtaining a sum greater than or equal to 5 is $1 - \frac{6}{36} = \frac{30}{36} = \frac{5}{6}$.

- 45.** Suppose the symbols ♠, ♥, and ♦ represent three one digit numbers and each symbol has the same value all the time. If the product $(2\spadesuit\heartsuit)1\diamondsuit$ gives 4674 and the sum $\diamondsuit4\heartsuit+1\diamondsuit5+2\spadesuit$ gives 836, then which of the following are the possible value of ♠, ♥ and ♦ respectively?

- A. 4, 8 and 9
B. 6, 4 and 9
C. ✓ **4, 4 and 6**
D. 9, 4 and 6

Answer: C

46. Four persons M, N, T and P work together to complete the same task. If M, N and T worked $(2/7)^{th}$, $(1/7)^{th}$ and $(2/9)^{th}$ of the task respectively, and P completed the remaining part of the task, then what is the part of task that P completed more than T?

- A. $22/63$ B. $\checkmark 8/63$
C. $2/3$ D. $41/63$

Answer: B

Together, M, N, and T completed $\frac{2}{7} + \frac{1}{7} + \frac{2}{9} = \frac{3}{7} + \frac{2}{9} = \frac{41}{63}$ of the task, leaving P to complete $1 - \frac{41}{63} = \frac{22}{63}$. The part of the task that P completed more than T is $\frac{22}{63} - \frac{2}{9} = \frac{22-14}{63} = \frac{8}{63}$.

47. Instructions: For Questions 53 and 54 using the information given in the table choose the correct answer from the given alternatives. (1)

Water tanks	Total Carrying capacity in Liters	Number of pipes surrounding the tank	Amount of matter in Liters that passes through each pipe in 20 minutes
T1	75,900	6	275
T2	95,680	8	260

Assuming that the tanks were empty and both the tanks started receiving water from all the pipes surrounding them at the same time, which one of the following is NOT true?

- A. Both tanks took equal length of time to be filled.
 B. Tanker T_1 requires 15 hours and 20 minutes to be filled.
 C. T_2 carries 62,400 liters in 10 hours.
 D. ✓ Tanker T_2 carries 75,250 liters in 15 hours.

Answer: D

Each pipe for T_2 delivers $260 \times 3 = 780$ L/hour, so 8 pipes deliver $8 \times 780 = 6240$ L/hour. In 15 hours, T_2 receives $15 \times 6240 = 93,600$ liters, making statement D false.

48. Instructions: For Questions 53 and 54 using the information given in the table choose the correct answer from the given alternatives. (1)

Water tanks	Total Carrying capacity in Liters	Number of pipes surrounding the tank	Amount of matter in Liters that passes through each pipe in 20 minutes
T1	75,900	6	275
T2	95,680	8	260

If all the pipes surrounding T_1 were working together and two of them stopped working after 5 hours, then how many liters of water is in T_1 after a total of 12 hours?

- A. 24,750
 B. ✓ 47,850
 C. 23,100
 D. 59,400

Answer: B

Each pipe delivers $275 \times 3 = 825$ L/hour. For the first 5 hours, all 6 pipes fill $5 \times 6 \times 825 = 24,750$ L, and for the remaining 7 hours, the 4 remaining pipes fill $7 \times 4 \times 825 = 23,100$ L, giving a total of $24,750 + 23,100 = 47,850$ liters.

49. A student increased her usual speed by 50% and reached at her school 20 minutes earlier than her usual time of arrival using the same path. Which one of the following is the time that could take her to reach the school by travelling with her usual speed (in minutes)? (1)

- A. 50
 B. 40
 C. ✓ 60
 D. 70

Answer: C

Increasing speed by 50% means the new speed is $\frac{3}{2}$ of the usual speed, so the time taken is $\frac{2}{3}$ of the usual time t . Since the time saved is $\frac{1}{3}t = 20$ minutes, the usual time is $t = 60$ minutes.

50. In a game of 80 points, where T and R are playing together. T has given 16 points to R. When M and T are playing together. T had given 20 points to M. Which one of the following is the number of points that M has to give to R when they play together in a game of 150 points? (1)

- A. 50
 B. 40
 C. ✓ 30
 D. 60

Answer: C

51. The following histogram presents the monthly salary of employees at a certain company in thousands of Birr. (1)
Histogram titled "Monthly Salary of Employees". Vertical axis labelled "Number of employees", marked 0, 5, 10, 15, 20, 25, 30, 35 with horizontal gridlines at each mark. Horizontal axis labelled "Monthly Salary in thousands of Birr of employees", with six adjacent class intervals: 4-8, 8-12, 12-16, 16-20, 20-24, 24-28.

What is the number of employees who earn monthly salary of less than Birr 16,000?

[Figure: The following histogram presents the monthly salary of employees at a certain company in thousands of Birr. Histogram titled "Monthly Salary of Employees". Vertical axis labelled "Number of employees", marked 0, 5, 10, 15, 20, 25, 30, 35 with horizontal gridlines at each mark. Horizontal axis labelled "Monthly Salary in thousands of Birr of employees", with six adjacent class intervals: 4-8, 8-12, 12-16, 16-20, 20-24, 24-28. Bar heights, each bar top resting exactly on a gridline: 4-8 reaches 30; 8-12 reaches 20; 12-16 reaches 20 (its top is drawn as one continuous line with the 8-12 bar); 16-20 reaches 15; 20-24 reaches 10; 24-28 reaches 5. The bars therefore step down by 5 employees at each class boundary after 8-12, and the six frequencies total 100 employees. The figure is reproduced in the document as a photograph of a printed chart, slightly skewed and blurred; no numeric labels are printed on the bars themselves, so the heights above were read against the printed gridlines.]

- A. 50
B. 60
C. ✓ 70
D. 65

Answer: C

The number of employees earning less than Birr 16,000 is the sum of the frequencies in the intervals 4-8, 8-12, and 12-16, which is $30 + 20 + 20 = 70$.

END OF THE MARKING KEY

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