

# Prepp

Your Personal Exams Guide



NDA



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SSC CGL



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MPSC



AFCAT



CSIR UDC NET



IBPS PO



UP POLICE



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UPTET



IBPS RRB



IBPS CLERK



IES



UPSC CAPF



SSC Stenogr..



RRB NTPC



SSC GD



RBI GRADE B



RBI Assistant



DSSSB

# SSC CGL 2024 (Tier-I) Previous Year Paper (09-Sep-2024) (Shift 1)

**Total Time:** 1 Hour

**Total Marks:** 200

## Instructions

1. Test will auto submit when the Time is up.
2. The Test comprises of multiple choice questions (MCQ) with one or more correct answers.
3. The clock in the top right corner will display the remaining time available for you to complete the examination.

## Navigating & Answering a Question

1. The answer will be saved automatically upon clicking on an option amongst the given choices of answer.
2. To deselect your chosen answer, click on the clear response button.
3. The marking scheme will be displayed for each question on the top right corner of the test window.

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## General Intelligence and Reasoning

1. Three statements are given, followed by three conclusions numbered I, II and III. Assuming the statements to be true, even if they seem to be at variance with commonly known facts, decide which of the conclusions logically follow(s) from the statements. (+2, -0.5)

**Statements:**

All pages are diaries.  
Some diaries are books.  
All books are notebooks.

**Conclusions:**

- I. No page is a notebook.
  - II. All pages are notebooks.
  - III. All diaries being notebooks is a possibility.
- 
- a. Both conclusion I and II follow
  - b. Only conclusions I and III follow
  - c. Only conclusion III follows
  - d. Only conclusion II follows

2. The position of how many letters will remain unchanged, if all the letters in the word BINDER are arranged in English alphabetical order? (+2, -0.5)
- a. None
  - b. One
  - c. Two

d. Three

3. In a certain code language:

(+2, -0.5)

- 'A + B' means 'A is the mother of B';
- 'A - B' means 'A is the brother of B';
- 'A × B' means 'A is the wife of B';
- 'A ÷ B' means 'A is the father of B'.

Based on the above, how is 4 related to 2 if '4 + 3 ÷ 2 ÷ 1 - 5'?

- a. Father's father
- b. Mother's mother
- c. Mother's father
- d. Father's mother

4. Identify the figure given in the options which when put in place of '?' will logically complete the series.

(+2, -0.5)



b.



c.

d.



M

5. 'WISK' is related to 'DRHP' in a certain way based on the English alphabetical order. In the same way, 'LENT' is related to 'OVMG'. To which of the following is 'BANG' related, following the same logic? (+2, -0.5)

- a. ZYLU
- b. ZYNS
- c. YZNU
- d. YZMT

6. Two sets of numbers are given below. In each set of numbers, certain mathematical operation(s) on the first number result(s) in the second number. Similarly, certain mathematical operation(s) on the second number result(s) in the third number and so on. Which of the given options follows the same set of operations as in the given sets? (+2, -0.5)

(Given Sets: 18 – 36 – 72 – 107; 15 – 30 – 60 – 95)

- a. 22 – 44 – 88 – 123
- b. 25 – 50 – 100 – 125
- c. 11 – 22 – 66 – 101
- d. 30 – 60 – 90 – 115

7. Select the number from the given options to complete the series: 25, 30, 40, ( +2, -0.5)  
55, 75, \_\_\_
- a. 105  
b. 85  
c. 80  
d. 100
- 
8. The position(s) of how many letters will remain unchanged if all the letters ( +2, -0.5) in the word 'ENTOMB' are arranged in English alphabetical order?
- a. Two  
b. None  
c. One  
d. Three



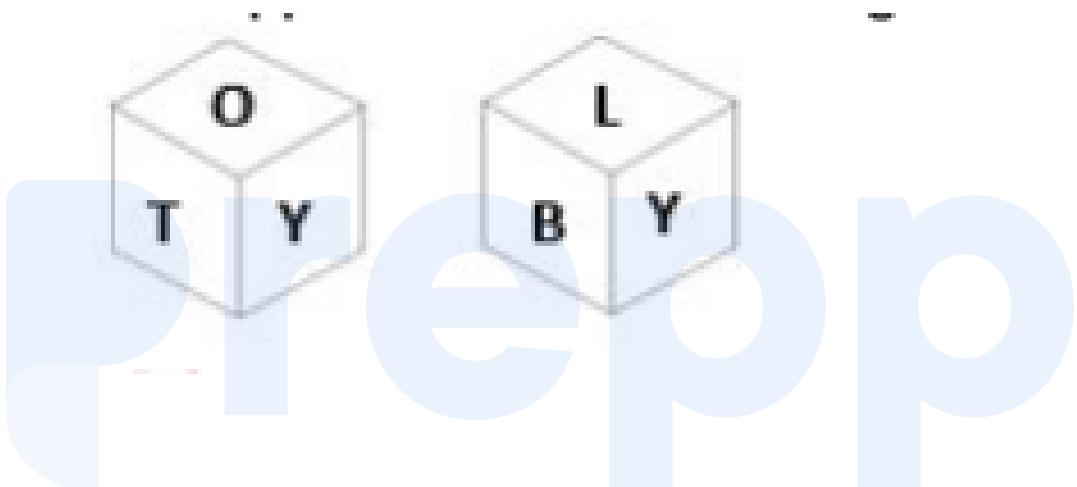
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9. Six words Eat, Cry, Play, Sleep, Run and Bath are written on different faces of ( +2, -0.5) a dice. Three positions of this dice are shown in the figure. Find the word on the face opposite to Eat.



- a. Play

- b. Cry
- c. Sleep
- d. Run

- 
10. Two different positions of the same dice with faces T, O, B, L, Y and V are shown below. Select the letter that will be on the face opposite to the one having L. (+2, -0.5)



- a. Y
- b. B
- c. O
- d. V

- 
- II. Select the word-pair that best represents a similar relationship to the one expressed in the pair of words given below. (+2, -0.5)

**Virus : Parasite**

- a. Fungus : Jasmine
- b. Amaltas : Tree

- c. Fenugreek : Micro organism
- d. Algae : Flower
- 
12. Select the set in which the numbers are related in the same way as are the numbers of the given sets: (+2, -0.5)
- (213, 157), (185, 129)
- a. (171, 123)
- b. (189, 141)
- c. (164, 108)
- d. (192, 152)
- 
13. Three of the following four options are alike in a certain way and thus form a group. Which is the one that does NOT belong to that group? (+2, -0.5)
- (NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits.)
- a.  $540 - 188 - 128$
- b.  $72 - 284 - 266$
- c.  $81 - 101 - 92$
- d.  $90 - 22 - 12$
- 
14. Which of the following terms will replace the question mark (?) in the given series? (+2, -0.5)

IMHP, MPJQ, QSLR, UVNS, ?

- a. YYPT
- b. YYOT
- c. YXPT
- d. XYPT

15. In a certain code language, 'FACED' is written as 'GZDDE' and 'VACAY' is written as 'WZDZZ'. How will 'LABOR' be written in that language? (+2, -0.5)

- a. MZCNS
- b. MBCPS
- c. MBDPS
- d. MADMS

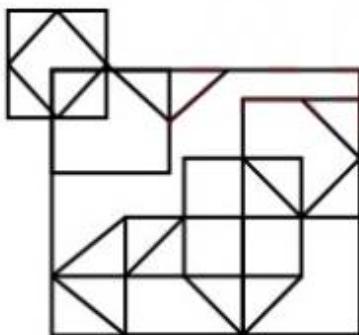
16. Which two signs should be interchanged to make the following equation correct? (+2, -0.5)

$$247 \div 13 + 16 \times 3 - 148 = 119$$

- a. + and ×
- b. - and +
- c. - and ×
- d. ÷ and ×

17. How many triangles are there in the given figure?

(+2, -0.5)



- a. 18
- b. 16
- c. 21
- d. 20

18. Select the correct mirror image of the given figure when the mirror is placed at MN.

(+2, -0.5)

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K G 2 F 7 p e



K G 2 F 7 q e

- a.

b.

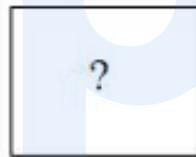
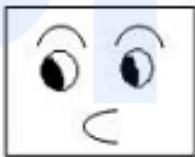
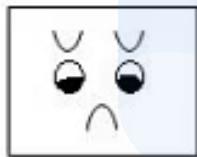
**KGZFJbe****KGZFJde**

c.

**KesFas**

d.

- 
19. Select the figure from the given option that can replace the question mark (?) in the following series. (+2, -0.5)



a.



b.



c.



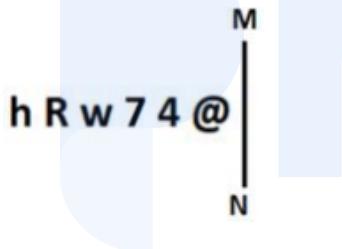
d.

---

20. In a certain code language, 'FIVE' is written as '12184410' and 'FOUR' is written as '12304236'. How will 'THREE' be written in that language? (+2, -0.5)

- a. 4016361110
  - b. 4016361310
  - c. 4016361212
  - d. 4016361010
- 

21. Select the correct mirror image of the given figure when the mirror is placed at MN as shown below. (+2, -0.5)



c. @ A T w R h  
d. @ A 7 w R h

---

22. In the following series, only one letter-cluster is incorrect. Select the incorrect letter-cluster: (+2, -0.5)

YCG, IMQ, SVZ, CGK, MQU

- a. SVZ
  - b. MQU
-

- c. CGK
- d. IMQ

---

23. Based on the English alphabetical order, three of the following four letter-clusters are alike in a certain way and thus form a group. Which is the one that DOES NOT belong to that group? (+2, -0.5)

(Note: The odd man out is not based on the number of consonants/vowels or their position in the letter-cluster.)

- a. KJE
- b. JHD
- c. FDZ
- d. AYU

---

24. What will come in the place of the question mark (?) in the following equation, if '+' and '-' are interchanged and '×' and '÷' are interchanged? (+2, -0.5)

$$342 \times 18 + 79 - 45 \div 3 = ?$$

- a. 65
- b. 85
- c. 75
- d. 55

---

25.  $24/7$  is related to  $12/7$  following a certain logic. Following the same logic,  $11/15$  is related to  $11/30$ . To which of the following is  $9/13$  related, following (+2, -0.5)

the same logic? NOTE: Operations should be performed on the whole numbers, without breaking down the numbers into their constituent digits. For example, operations on 13 such as adding, deleting, multiplying, etc., can be performed. However, breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed.

- a.  $15/26$
- b.  $9/39$
- c.  $9/26$
- d.  $10/27$



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## General Awareness

26. Who among the following is the world-renowned exponent of the bamboo flute? (+2, -0.5)

- a. MS Subbulakshmi
- b. Ravi Shankar
- c. Hariprasad Chaurasia
- d. Bismillah Khan

27. What is net investment? (+2, -0.5)

- a. Sum of all the investments in a country
- b. Gross investment + depreciation
- c. Gross capital investment - indirect taxes
- d. Gross investment - depreciation

28. India won the ICC Men Cricket World Cup for the first time in which of the following years? (+2, -0.5)

- a. 1996
- b. 1992
- c. 1987
- d. 1983

29. Match the following - (+2, -0.5)

**Institutes**

- a. Asiatic Society of Bengal
- b. Sanskrit College of Benaras
- c. Fort William College
- d. Calcutta Madrasa

**a.** a-ii, b-i, c-iv, d-iii

**b.** a-iii, b-iv, c-i, d-ii

**c.** a-iv, b-iii, c-ii, d-i

**d.** a-i, b-ii, c-iii, d-iv

**Their respective founder**

- i. Warren Hastings
- ii. Lord Wellesley
- iii. Jonathan Duncan
- iv. Sir William Jones

30. Kathakali, one of the classical dances of India, is predominantly performed in which of the following states of India? (+2, -0.5)

**a.** Assam

**b.** Manipur

**c.** Uttar Pradesh

**d.** Kerala

31. Identify the oldest iron and steel company of India from the following options. (+2, -0.5)

**a.** Tata Iron & Steel Company (TISCO)

**b.** Visvesvaraya Iron & Steel Works

**c.** Indian Iron & Steel Company (IISCO)

- 
- d. Mysore Iron & Steel Works
- 
32. The magnificent Kailasa temple at Ellora was built during the reign of which Rashtrakuta king? (+2, -0.5)
- a. Krishna I
  - b. Indra III
  - c. Govinda III
  - d. Amoghavarsha
- 
33. In which state/UT is the Hemis festival celebrated? (+2, -0.5)
- a. Punjab
  - b. Sikkim
  - c. Lakshadweep
  - d. Ladakh
- 
34. Which of the following is the largest artificial lake of Asia? (+2, -0.5)
- a. Naini Lake
  - b. Bhopal Lake
  - c. Dal Lake
  - d. Chilika Lake
-

35. In 2002, Zakir Hussain became the youngest percussionist to be honored with which award? (+2, -0.5)

- a. Sangeet Natak Akademi Award
- b. Grammy Award
- c. Padma Bhushan
- d. National Heritage Fellowship

36. Microbes like Rhizobium, Nitrosomonas, and Nitrobacter are used for: (+2, -0.5)

- a. nitrogen cycling
- b. carbon cycling
- c. water cycling
- d. sulphur cycling

37. With reference to the Sepoy Mutiny of 1857, on which of the following dates did the soldiers at Meerut start their journey to Delhi? (+2, -0.5)

- a. 10 May
- b. 19 April
- c. 2 June
- d. 29 March

38. Who among the following was selected as the Sherpa for India's G20 hosted in 2022–23? (+2, -0.5)

- a. Piyush Goyal
- b. Ashwini Vaishnaw
- c. Shaktikanta Das
- d. Amitabh Kant

39. Purvanchal Himalayas does NOT comprise of: (+2, -0.5)

- a. Naga hills
- b. Pir Panjal range
- c. Manipur hills
- d. Mizo hills

40. In which year did India make its Olympic debut in hockey? (+2, -0.5)

- a. 1936
- b. 1932
- c. 1924
- d. 1928

41. A student, on his school assignment, is taking a session on how to make compost at home for using it at a park. Which fundamental duty is he (+2, -0.5)

performing?

- a. To strive towards excellence in all spheres of individual and collective activity
- b. To safeguard public property and to abjure violence
- c. To develop the scientific temper, humanism and the spirit of inquiry
- d. To protect and improve the natural environment

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42. In August 2022, the Ministry of Social Justice and Empowerment launched the \_\_\_\_\_ scheme, with an aim to provide comprehensive rehabilitation services to people engaged in begging in 75 municipalities.

- a. TWINKLE-75
- b. BEAM-75
- c. SMILE-75
- d. RISE-75

**Your Personal Exams Guide**  
(+2, -0.5)

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43. Which is the National Mission for Financial Inclusion to ensure access to financial services, namely, a basic savings and deposits account, remittance, credit, insurance, pension in an affordable manner?
- a. Deendayal Antyodaya Yojana
  - b. Deen Dayal Upadhyaya Grameen Kaushalya Yojana
  - c. Swarnjayanti Gram Swarozgar Yojana
  - d. Pradhan Mantri Jan Dhan Yojana

(+2, -0.5)

---

44. Which of the following plays was NOT written by Harshavardhana?

- a. Vikramorvashiyam
- b. Ratnavali
- c. Nagananda
- d. Priyadarshika

(+2, -0.5)

---

45. The organisms that do not have a defined nucleus or organelles are classified into \_\_\_\_\_ Kingdom.

- a. Fungi
- b. Protista
- c. Monera
- d. Plantae

(+2, -0.5)

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46. Which Article of the Constitution of India provides that ‘there shall be a Vice President of India’? (+2, -0.5)

- a. Article 61
- b. Article 63
- c. Article 65

d. Article 62

---

47. A javelin thrown by an athlete is in (+2, -0.5)

----- motion.

a. Oscillatory

b. Periodic

c. Rectilinear

d. Curvilinear

---

48. The green revolution technology (+2, -0.5)

resulted in an increase in the production  
of cereal crops from 72.4 million tons in  
1965-66 to ----- million tons in  
1978-79.

a. 150.8

b. 165.9

c. 131.9

d. 141.2

---

49. Calculate the oxidation number of 'S' in (+2, -0.5)

$\text{H}_2\text{S}_2\text{O}_7$ .

a. 3

b. 7

c. 6

d. 2

- 
50. Which of the following is NOT an amendment made to the Airport Economic Regulatory Authority (AERA) Amendment Act, 2021? (+2, -0.5)
- a. The government can call any airport a major airport just by notification.
  - b. The government will club together profit-making and loss-making airports.
  - c. The government can offer airports as a package in PPP mode to the prospective bidders.
  - d. A major airport is one which has an annual traffic of minimum 35 lakh passengers.

## Quantitative Aptitude

51. Which digits should come in place \* and \$, respectively, if the number 72864\*\\$ is divisible by both 8 and 5? (+2, -0.5)

- a. 4 and 0
- b. 2 and 0
- c. 2 and 5
- d. 4 and 5

52. The given table shows the number of soaps sold by four different companies in 4 different months. The total no. of soaps sold by companies Q and S together in May is what percentage more than the no. of soaps sold by company P in July? (+2, -0.5)

Month Company	May	June	July	August
P	1924	1780	1820	1490
Q	1540	1245	1648	2450
R	2035	1485	1350	1650
S	1736	1855	1470	1180

- a. 75%
- b. 90%
- c. 65%
- d. 80%

53. In a triangle PQR, S is a point on the side QR such that  $PS \perp QR$ . Then which of the following options is true? (+2, -0.5)

- a.  $PS^2 + PR^2 = PQ^2 + QR^2$
- b.  $PR^2 + QS^2 = PQ^2 + SR^2$
- c.  $PQ^2 + PR^2 = QS^2 + SR^2$

---

d.  $PS^2 + QS^2 = PQ^2 + PR^2$

---

54. Simplify: (+2, -0.5)

$15.5 - [3 - \{7 - (5 - (14.5 - 13.5))\}]$ .

- a. 15.5
- b. 13.5
- c. 12.5
- d. 14.5

---

55. The incomes of P, Q, and R are in the ratio 10 : 12 : 9, and their expenditures are in the ratio 12 : 15 : 8. If Q saves 25% of his income, then what is the ratio of the savings of P, Q, and R? (+2, -0.5)

- a. 15 : 14 : 21
- b. 14 : 15 : 21
- c. 21 : 15 : 14
- d. 21 : 14 : 15

---

56. The classification of 100 students based on the marks obtained by them in English and Mathematics in an examination is given in the table below. (+2, -0.5)  
Study the table and answer the question that follows:

Student/Subject	Maths	Physics	Chemistry	English	Physical Education
Tarun	65	80	75	85	90
Rohit	69	76	80	88	94
Mohit	73	84	77	90	95
Shobhit	76	85	76	86	78
Sumit	90	88	78	82	68

If at least 40% marks in Mathematics are required for pursuing higher studies in Mathematics, how many students will be eligible to pursue higher studies in Mathematics?

- a. 55
- b. 65
- c. 70
- d. 50

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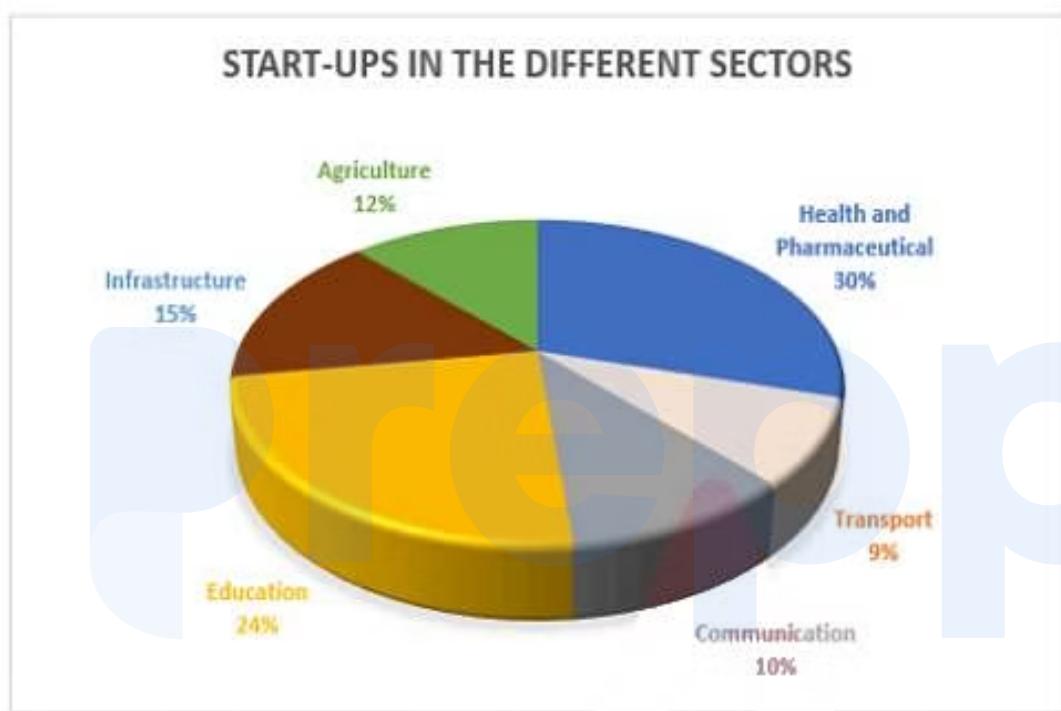
57. In triangles ABC and DEF, AB = FD and  $\angle A = \angle D$ . The two triangles are congruent by SAS criterion if: (+2, -0.5)
- a. BC = DE
  - b. AC = DE
  - c. BC = EF
  - d. AC = EF

58. Two pipes, A and B, can fill a tank in 10 minutes and 20 minutes, respectively. The pipe C can empty the tank in 30 minutes. All three pipes are opened at the beginning, but pipe C is closed 2 minutes before the tank is filled. In what time will the tank be full (in minutes)? (+2, -0.5)
- a. 12  
b. 10  
c. 8  
d. 6
- 
59. A payment of ₹120 is made with ₹10, ₹5, and ₹2 coins. A total of 25 coins are used. Which of the following is the number of ₹10 coins used in the payment? (+2, -0.5)
- a. 6  
b. 8  
c. 10  
d. 4
- 
60. If  $28.9 : x :: x : 36.1$ , and  $x > 0$ , then find the value of  $x$ . (+2, -0.5)
- a. 38.3  
b. 30.4  
c. 32.3  
d. 35

61. Study the given pie chart carefully and answer the question that follows. (+2, -0.5)

The given pie chart shows that the number of successful start-ups in different sectors in a particular year. If the total no. of successful start-ups is 2910 the find the number of start-ups in the education and agriculture sectors. (Neglect the decimal part).

- a. 698
- b. 1048
- c. 1074
- d. 1047



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62. The height of a cylinder is 20 cm. The lateral surface area is  $1760 \text{ cm}^2$ . Its volume is: (+2, -0.5)

- a.  $12320 \text{ cm}^3$
- b.  $12302 \text{ cm}^3$
- c.  $12203 \text{ cm}^3$
- d.  $7600 \text{ cm}^3$

63. Raj divides ₹1,200 in the ratio 2 : 1 : 3 among three of his friends. The amount equal to the sum of three times the largest share and two times the smallest share is: (+2, -0.5)
- a. ₹2,400
  - b. ₹1,800
  - c. ₹2,200
  - d. ₹2,000

64. A shopkeeper marked an article at ₹5,000. The shopkeeper allows successive discounts of 20%, 15%, and 10%. The selling price of the article is: (+2, -0.5)
- a. ₹2,750
  - b. ₹3,000
  - c. ₹2,800
  - d. ₹3,060

65. The average of 12 numbers is 48. The average of the first 5 numbers is 45, and the average of the next 4 numbers is 52. If the 10th number is 10 less than the 11th number and 5 more than the 12th number, then the average of the 11th and 12th numbers is: (+2, -0.5)
- a. 50.5
  - b. 46.5
  - c. 47.5

d. 48.5

66. Find the value of the following expression.

(+2, -0.5)

$$\frac{1 + \sin \theta}{\sqrt{1 - \sin^2 \theta}}$$

a.  $\sec \theta + \tan \theta$

b.  $\operatorname{cosec} \theta + \tan \theta$

c.  $\operatorname{cosec} \theta + \cot \theta$

d.  $\sec \theta + \cot \theta$

The value of  $\left( \frac{\sin \theta - 2\sin^3 \theta}{2\cos^3 \theta - \cos \theta} \right)^3 \cdot \frac{1}{\tan \theta} - \sec^2 \theta$  is:

67. a. 2

(+2, -0.5)

b. 1

c. 0

d. -1

---

68. Let  $t = \frac{2}{5}$ , then the value of the expression  $t^3 + \left(\frac{3}{5}\right)^3 + \frac{9}{5}t$  is:    a.  $1/5$     (+2, -0.5)

b. 1

c. 2

d.  $1/2$

---

69. M and N walk along a circular track. They start at 5:00 a.m. from the same point in the opposite directions. M and N walk at a speed of 5 rounds per hour and 2 rounds per hour, respectively. How many times will they cross each other before 6.30 a.m. on the same day?    (+2, -0.5)

a. 10

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b. 3

c. 5

d. 7

---

Two circles  $C_1$  and  $C_2$  touch each other externally. The radius of  $C_1 = 16$  cm and the radius of  $C_2 = 8$  cm. Find the length (in cm) of their common tangent.

$8\sqrt{3}$

70.

a. (+2, -0.5)

b.  
16 $\sqrt{3}$

c.  
8 $\sqrt{2}$

d.  
16 $\sqrt{2}$

---

If  $x + \frac{1}{x} = 15$ , then the value of  $\frac{7x^2 - 9x + 7}{x^2 - x + 1}$  is:

71. a.  $-48/7$   
 b.  $-22/7$   
 c.  $48/7$   
 d.  $22/7$

(+2, -0.5)

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72. Study the given table and answer the question that follows. (+2, -0.5)

The given table shows the production of different types of refrigerators in a company. In which of the given year(s) was the production of B type refrigerator closest to its average production over the given years?

Years	Types of Refrigerators		
	A	B	C
2011	2018	1800	1932
2012	2040	1890	1800
2013	2035	1910	1890
2014	2020	1940	1978
2015	1997	1960	1900

- a. Both 2012 and 2013  
 b. Both 2013 and 2015  
 c. 2014

d. Only 2012

---

73. The measures of the three angles of a triangle are in the ratio  $17 : 13 : 15$ . (+2, -0.5)

Find the positive difference between the greatest  
and the smallest of these three angles.

a.  $16^\circ$

b.  $24^\circ$

c.  $20^\circ$

d.  $12^\circ$

---

74. If  $2\operatorname{cosec}^2\theta + 3\cot^2\theta = 17$ , then the value of ' $\theta$ ' when  $0^\circ \leq \theta \leq 90^\circ$  is: a. (45, -0.5)

b.  $90^\circ$

c.  $30^\circ$

d.  $75^\circ$

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75. A certain sum of money becomes seven times itself when invested at a (+2, -0.5)

certain rate of simple interest, in 14 years. How

much time (in years, rounded off to 2 decimal places) will it take to  
become 18 times itself at the same rate?

a. 27.33

b. 39.67

c. 42.78

d. 35.5

## English Comprehension

76. Select the option that can be used as a one-word substitute for the given group of words: (+2, -0.5)

**A false idea or belief**

- a. Reticence
- b. Atrophy
- c. Fallacy
- d. Entropy

77. Identify the most appropriate ANTONYM of the given word: (+2, -0.5)

**Secure**

- a. Succeed
- b. Save
- c. Attack
- d. Trundle

78. Select the most appropriate option to substitute the underlined segment in the given sentence: (+2, -0.5)

Gourav was no good than a foolish person.

- a. no better
- b. not good

- c. no best
- d. not best

---

79. Select the option that corrects the error in the given sentence: (+2, -0.5)

**He ran quick to catch the bus.**

- a. quiet
- b. rapid
- c. insipid
- d. quickly

---

80. Select the most appropriate synonym of the given word: (+2, -0.5)

**Acquiesce**

- a. Desist
- b. Cease
- c. Thwart
- d. Concur

---

81. Select the option that can be used as a one-word substitute for the given group of words: (+2, -0.5)

**That which cannot be conquered**

- a. Invisible

- b. Indelible
  - c. Ineffable
  - d. Invincible
- 

82. Select the most appropriate synonym for the underlined word in the given sentence: (+2, -0.5)

**His ambition in life is to become a happy and satisfied man.**

- a. Apathy
  - b. Satisfaction
  - c. Eagerness
  - d. Amend
- 

83. Read the sentence carefully and select the most suitable idiom to fill in the blank: (+2, -0.5)

The renowned publisher decided to withdraw a book from the market. No one was interested in the book as the arguments presented were \_\_\_\_\_.

- a. high and mighty
  - b. out of the woods
  - c. beside the mark
  - d. under the rose
-

84. Select the most appropriate ANTONYM of the given word: (+2, -0.5)

**Receive**

- a. Admit
- b. Exile
- c. Reward
- d. Fund

85. Select the option that expresses the following sentence in passive voice: (+2, -0.5)

**Sonam does not like bananas.**

- a. Banana is not liked by Sonam.
- b. Bananas have not been liked by Sonam.
- c. Bananas are not liked by Sonam.
- d. Bananas had not been liked by Sonam.

86. Sentences of a paragraph are given below in jumbled order. Arrange the sentences in the correct order to form a meaningful and coherent paragraph: (+2, -0.5)

- A. The genuine beliefs, though not unconsciously acquired by most children; and even if they depart from these beliefs in later life
- B. Something of them remains deeply implanted, ready to emerge in a time of stress or crisis
- C. The importance of education in forming character and opinion is very great and well recognized by all

D. Education is, as a rule, the strongest force on the side of what exists and against fundamental change

- a. DCAB
- b. DABC
- c. CBAD
- d. CABD

---

87. Select the option that can be used as a one-word substitute for the underlined group of words: (+2, -0.5)

**In Indian mythology, most of the Asuras wish to be never able to die.**

- a. Invincible
- b. Impervious
- c. Invisible
- d. Immortal

---

88. Select the option that expresses the given sentence in passive voice: (+2, -0.5)

**Someone has taken my secret diary.**

- a. My secret diary had been taken by someone.
- b. My secret diary has to be taken by someone.
- c. My secret diary has been taken by someone.
- d. My secret diary will have been taken by someone.

89. Select the most appropriate synonym of the bracketed word in the following sentence to fill in the blank: (+2, -0.5)

During Covid times, many organizations made \_\_\_\_\_ (sentimental) appeals to raise funds for migrant workers.

- a. Mawkish
- b. Sincere
- c. Cynical
- d. Practical

90. Select the most appropriate meaning of the underlined word in the given sentence: (+2, -0.5)

He is an atheist, although he respects everyone's belief.

- a. One who believes in God
- b. One who believes in nature
- c. One who is extremist
- d. One who does not believe in God

91. Select the most appropriate meaning of the underlined idiom in the following sentence: (+2, -0.5)

In my new office, all employees were different, so I felt like a fish out of water.

- a. Uncomfortable

- b. Homeless
  - c. Frustrated
  - d. Disappointed
- 

92. Select the INCORRECTLY spelt word: (+2, -0.5)

- a. Embarrass
  - b. Occurrence
  - c. Exhilerate
  - d. Accommodate
- 

93. The following sentence has been divided into four segments. Identify the segment that contains an error: (+2, -0.5)

Mrs. Sreelakshmi's / musical intelligence / is superior than / Mrs. Suma's.

- a. Mrs. Suma's.
  - b. musical intelligence
  - c. is superior than
  - d. Mrs. Sreelakshmi's
- 

94. Select the option that will improve the underlined part of the given sentence: (+2, -0.5)

If I was the queen, I would give a handsome sum towards education.

- a. will be the queen
- b. were the queen
- c. have been the queen
- d. would be the queen

95. Select the INCORRECTLY spelt word: (+2, -0.5)

- a. Exceed
- b. Proceed
- c. Succeed
- d. Preceed

96. Comprehension: (+2, -0.5)

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

The beginning of the story is (1) \_\_\_\_\_ in its presentation but (2) \_\_\_\_\_ the style eases out and becomes haunting in its simplicity. The author brings out the human elements in his story. This common element of sympathy and sacrifice is given a new (3) \_\_\_\_\_ by the old artist who shows by his last desperate act that one can be a hero for one day if only one cares (4) \_\_\_\_\_. O Henry's treatment of his material is balanced and controlled, a fine (5) \_\_\_\_\_ of humour and pathos.

Select the most appropriate option to fill in blank number 1:

- a. Prone

- b. Delectable
  - c. Quaint
  - d. Habitual
- 

**97. Comprehension:****(+2, -0.5)**

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

The beginning of the story is (1) \_\_\_\_\_ in its presentation but (2) \_\_\_\_\_ the style eases out and becomes haunting in its simplicity. The author brings out the human elements in his story. This common element of sympathy and sacrifice is given a new (3) \_\_\_\_\_ by the old artist who shows by his last desperate act that one can be a hero for one day if only one cares (4) \_\_\_\_\_. O Henry's treatment of his material is balanced and controlled, a fine (5) \_\_\_\_\_ of humour and pathos.

Select the most appropriate option to fill in blank number 2:

- a. Hardly
  - b. Recently
  - c. Initially
  - d. Gradually
- 

**98. Comprehension:****(+2, -0.5)**

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

The beginning of the story is (1) \_\_\_\_\_ in its presentation but (2) \_\_\_\_\_ the style eases out and becomes haunting in its simplicity.

The author brings out the human elements in his story. This common element of sympathy and sacrifice is given a new (3) \_\_\_\_\_ by the old artist who shows by his last desperate act that one can be a hero for one day if only one cares (4) \_\_\_\_\_. O Henry's treatment of his material is balanced and controlled, a fine (5) \_\_\_\_\_ of humour and pathos.

Select the most appropriate option to fill in blank number 3:

- a. Supervision
- b. Condition
- c. Dimension
- d. Infection

---

**99. Comprehension:**

(+2, -0.5)

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

The beginning of the story is (1) \_\_\_\_\_ in its presentation but (2) \_\_\_\_\_ the style eases out and becomes haunting in its simplicity. The author brings out the human elements in his story. This common element of sympathy and sacrifice is given a new (3) \_\_\_\_\_ by the old artist who shows by his last desperate act that one can be a hero for one day if only one cares (4) \_\_\_\_\_. O Henry's treatment of his material is balanced and controlled, a fine (5) \_\_\_\_\_ of humour and pathos.

Select the most appropriate option to fill in blank number 4:

- a. Through
- b. Though

- c. Tough
- d. Enough

**100. Comprehension:****(+2, -0.5)**

In the following passage, some words have been deleted. Read the passage carefully and select the most appropriate option to fill in each blank.

The beginning of the story is (1) \_\_\_\_\_ in its presentation but (2) \_\_\_\_\_ the style eases out and becomes haunting in its simplicity. The author brings out the human elements in his story. This common element of sympathy and sacrifice is given a new (3) \_\_\_\_\_ by the old artist who shows by his last desperate act that one can be a hero for one day if only one cares (4) \_\_\_\_\_. O Henry's treatment of his material is balanced and controlled, a fine (5) \_\_\_\_\_ of humour and pathos.

Select the most appropriate option to fill in blank number 5:

- a. Legend
- b. Ascend
- c. Blend
- d. Amend

## Answers

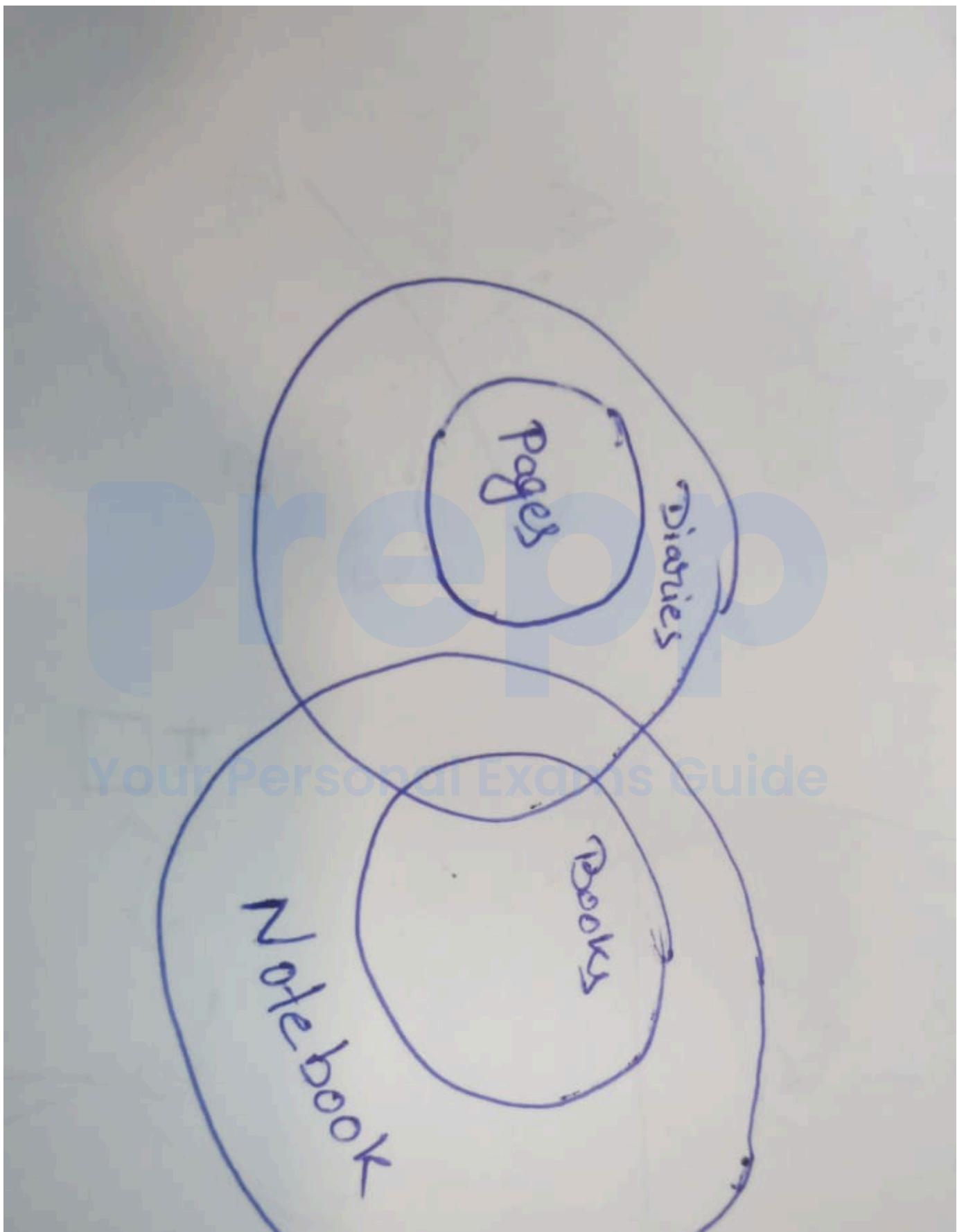
### 1. Answer: c

#### Explanation:

Conclusion III logically follows because it is possible for all diaries to be notebooks based on the given statements. Conclusions I and II contradict the given facts.



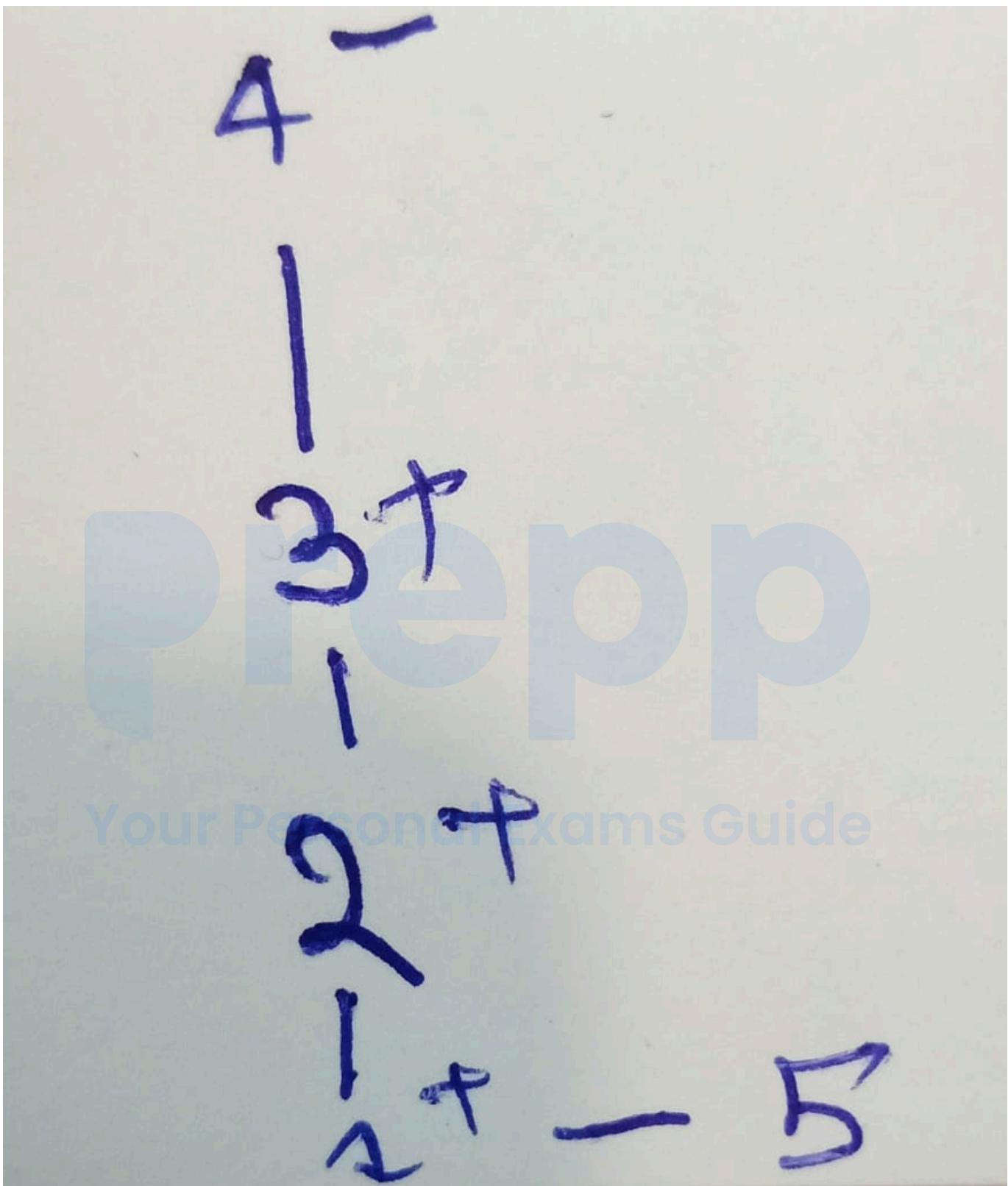
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**2. Answer: c****Explanation:**

When BINDER is arranged alphabetically as BDEINR, the letters B and R retain their positions. Thus, two positions remain unchanged.

**Your Personal Exams Guide****3. Answer: d****Explanation:**



The relationship sequence deciphers that 4 is the mother of 3, who is the father of 2. Thus, 4 is 2's Father's Mother.

**4. Answer: c****Explanation:**

The correct answer is Option 3.

**5. Answer: d****Explanation:**

The logic involves reversing of positions in alphabetical order. Applying the same to 'BANG' gives 'YZMT'.

**6. Answer: a****Your Personal Exams Guide**

The pattern is:

1. Multiply by 2 for the first two steps.
2. Add 35 for the third step.

For 22 – 44 – 88 – 123:

- $22 \times 2 = 44$
- $44 \times 2 = 88$
- $88 + 35 = 123$

Thus, it follows the same logic. **Answer: 22 – 44 – 88 – 123.**

---

Each set follows a consistent arithmetic or geometric progression. Doubling, followed by addition, matches with option 1.

---

**7. Answer: d****Explanation:**

The series increments by +5, +10, +15, +20. The next increment is +25, resulting in 100.

---

**8. Answer: b****Explanation:**

When ENTOMB is rearranged alphabetically as BEMNOT, the positions of M and O remain unchanged. Thus, two positions remain unchanged.

---

**9. Answer: d****Explanation: Your Personal Exams Guide**

By analyzing the dice positions and the relative arrangement of the words, we can determine that "Run" is opposite to "Eat."

---

**10. Answer: c****Explanation:**

From the dice positions provided, the faces opposite to each other can be deduced. "O" is opposite to "L."

**11. Answer: b****Explanation:**

The pair "Virus : Parasite" represents a relationship where one entity is a type of another. Similarly, "Amaltas : Tree" represents a classification.

**12. Answer: c****Explanation:**

The pattern between the numbers involves subtraction of a consistent value. Observing the difference (i.e 56), the correct set is (164, 108).

**13. Answer: b****Explanation:**

The sequences follow a specific arithmetic progression, except for "72 – 284 – 266," which does not match the consistent logic of the other groups.

**14. Answer: a****Explanation:**

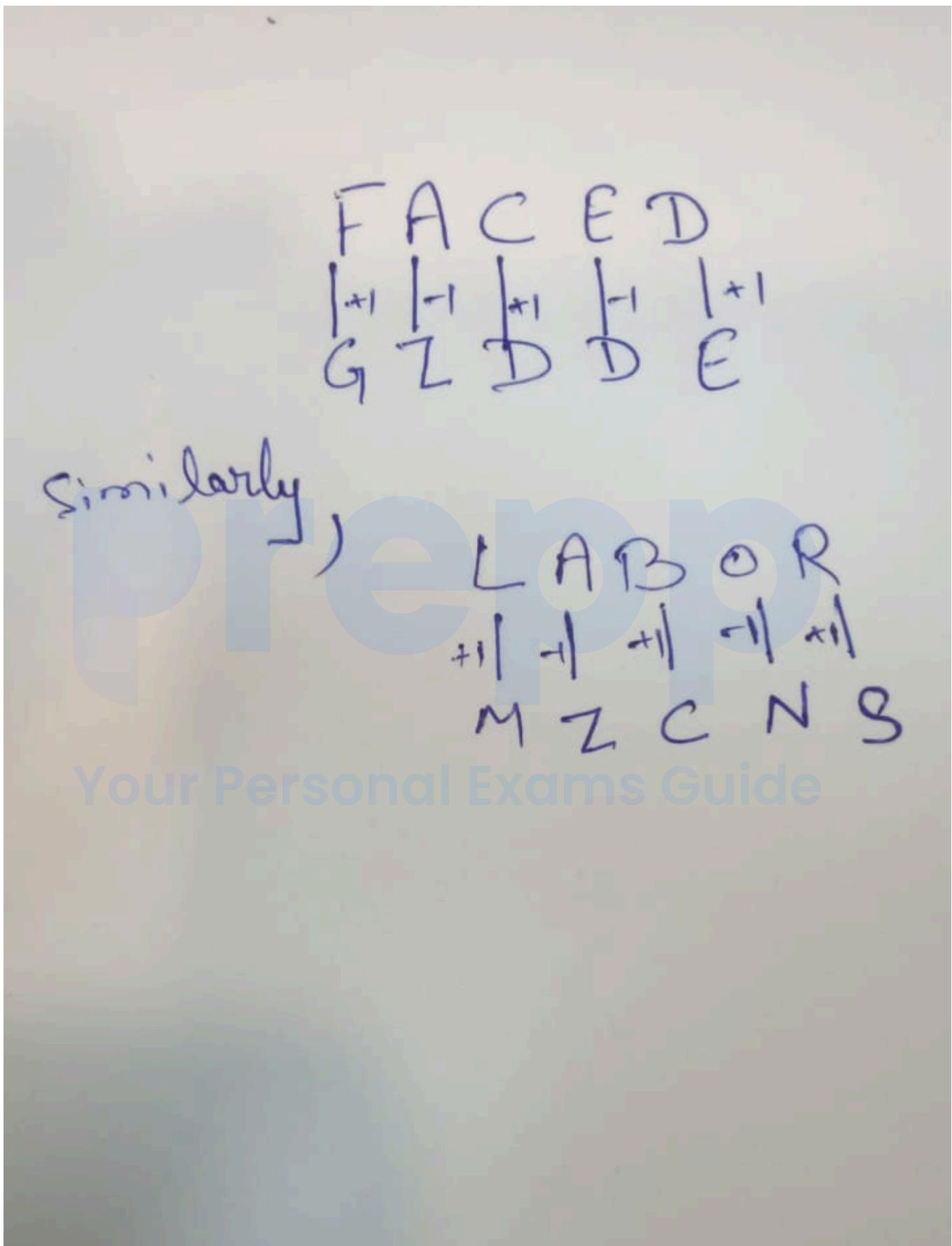
Observing the sequence, each letter in the series follows a consistent progression in the alphabetical order. The correct term that completes the series is "YYPT."

15. Answer: a

Explanation:



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**16. Answer: b**

**Explanation:**

By interchanging - and + the equation becomes mathematically valid:  $247 \div 13 - 16 \times 3 + 148 = 119$

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**17. Answer: c**

**Explanation:**

Counting all possible triangles in the figure, including smaller and larger ones formed by combining multiple segments, the total is 21.

**18. Answer: b**

**Explanation:**

The correct mirror image of the figure when the mirror is placed at MN is depicted by Figure 2. This is determined by reflecting the elements across the mirror line.

---

**19. Answer: a****Explanation:**

The correct answer is option 1 that follow the pattern.

**20. Answer: d****Explanation:**

Analyzing the encoding rules, the code for each letter is generated based on specific arithmetic operations. Applying these rules to "THREE" gives "4016361010"

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**21. Answer: a****Explanation:**

The correct mirror image is determined by reflecting all elements across the mirror line MN. Figure 2 represents this accurately.



**22. Answer: a****Explanation:**

All the given words have difference of 4 between there next letter (i.e Y + 4 = C , C + 4 = G), SVG is different from this letter cluster.

**23. Answer: a****Explanation:**

The letter-clusters follow a pattern where the difference between the positions of letters in each cluster is consistent. "KJE" does not follow this pattern, making it the odd one out. (i.e J - 2 = H - 4 = D)

**24. Answer: c****Explanation:**

After interchanging the signs as indicated, the equation becomes:

**$342 \div 18 - 79 + 45 \times 3 = 75$ .** Calculating step by step:

$$342 \div 18 = 19,$$

$$19 - 79 = -60,$$

$$-60 + (45 \times 3) = -60 + 135 = 75.$$

**25. Answer: c****Explanation:**

The correct answer is option 3.

### **Step 1: Understand the relationship**

#### **1. $7/24$ and $12/7$**

We examine how  $7/24$  is related to  $12/7$ :

- **Numerator transformation:**  $7 \rightarrow 12$  (Add 5 to the numerator).
- **Denominator transformation:**  $24 \rightarrow 7$  (Take the reciprocal of the numerator and denominator from  $24 \rightarrow 7$ ).

#### **2. $11/15$ and $11/30$**

Now, analyze how  $11/15$  is related to  $11/30$ :

- **Numerator transformation:**  $11 \rightarrow 11$  (No change in the numerator).
- **Denominator transformation:**  $15 \rightarrow 30$  (Multiply the denominator by 2).

### **Step 2: Apply the logic to $9/13$**

Now apply the same logic to  $9/13$ :

- **Numerator transformation:**  $9 \rightarrow 9$  (No change in the numerator, similar to the second pair).
- **Denominator transformation:**  $13 \rightarrow 26$  (Multiply the denominator by 2, as done in the second pair).

### **Final Answer:**

The related fraction for  $9/13$  is  **$9/26$** .

---

### **26. Answer: c**

#### **Explanation:**

Hariprasad Chaurasia is globally recognized for his mastery of the bamboo flute and has contributed significantly to Indian classical music.

---

**27. Answer: d****Explanation:**

Net investment is calculated as Gross Investment minus Depreciation, representing the actual increase in the asset base.

---

**28. Answer: d****Explanation:**

India won its first ICC Men's Cricket World Cup under the captaincy of Kapil Dev in 1983 by defeating the West Indies in the final.

---

**29. Answer: c****Your Personal Exams Guide**  
**Explanation:**

The correct answer is Option 3.

- a. Asiatic Society of Bengal – iv. Sir William Jones
  - b. Sanskrit College of Benaras – iii. Jonathan Duncan
  - c. Fort William College – ii. Lord Wellesley
  - d. Calcutta Madrasa – i. Warren Hastings
- 

**30. Answer: d****Explanation:**

---

Kathakali is a traditional Indian dance-drama style that originated in Kerala, known for its elaborate costumes and facial makeup.

---

**31. Answer: a**

**Explanation:**

Tata Iron & Steel Company, established in 1907, is the oldest iron and steel company in India.

---

**32. Answer: a**

**Explanation:**

The Kailasa temple at Ellora was constructed under the patronage of Krishna I of the Rashtrakuta dynasty during the 8th century.

---

**33. Answer: d**

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**Explanation:**

The Hemis festival is celebrated in Ladakh to honor Guru Padmasambhava, an important figure in Tibetan Buddhism.

---

**34. Answer: b**

**Explanation:**

Bhopal Lake, also known as the Upper Lake, is the largest artificial lake in Asia and is located in Madhya Pradesh, India.

**35. Answer: c****Explanation:**

Zakir Hussain, a renowned tabla player, received the Padma Bhushan Award in 2002, recognizing his contribution to Indian classical music.

**36. Answer: a****Explanation:**

Rhizobium, Nitrosomonas, and Nitrobacter are crucial in the nitrogen cycle. Rhizobium fixes atmospheric nitrogen into usable forms for plants through symbiosis with legumes. Nitrosomonas converts ammonia to nitrites, and Nitrobacter converts nitrites to nitrates, which are absorbed by plants.

**37. Answer: a****Your Personal Exams Guide**

The Sepoy Mutiny of 1857 began at Meerut on 10 May 1857, when soldiers rebelled against the British East India Company over grievances. They marched to Delhi to seek support from the Mughal emperor Bahadur Shah II, marking a significant moment in India's struggle for independence.

**38. Answer: d****Explanation:**

Amitabh Kant, former CEO of NITI Aayog, was appointed as the Sherpa for India during its presidency of the G20 in 2022–23. The Sherpa prepares agendas and facilitates discussions among member countries on economic and development issues.

---

**39. Answer: b****Explanation:**

The Purvanchal Himalayas, located in northeastern India, include the Naga hills, Manipur hills, and Mizo hills. The Pir Panjal range, however, is part of the western Himalayas, primarily located in Jammu and Kashmir, and is unrelated to the Purvanchal range.

**40. Answer: d****Explanation:**

India made its Olympic debut in hockey in 1928 at the Amsterdam Olympics. The team, led by Jaipal Singh, won its first gold medal without conceding a single goal throughout the tournament. This marked the beginning of India's dominance in field hockey at the Olympics.

---

**41. Answer: d****Explanation:**

Creating compost is an activity that directly contributes to protecting and improving the natural environment, aligning with Article 51A(g) of the Indian Constitution. This fundamental duty emphasizes environmental conservation, including actions to prevent pollution and maintain ecological balance.

**42. Answer: c****Explanation:**

SMILE-75 (Support for Marginalized Individuals for Livelihood and Enterprise) is a scheme launched to rehabilitate individuals engaged in begging. It provides skill development, rehabilitation centers, and social integration, to help them reintegrate into society and lead dignified lives.

**43. Answer: d****Explanation:**

Pradhan Mantri Jan Dhan Yojana (PMJDY) is a financial inclusion initiative launched in 2014 to provide access to basic banking services, including savings accounts, credit, insurance, and pensions. It aims to promote financial literacy and inclusion, especially among the unbanked population in rural and urban areas.

**44. Answer: a****Explanation:**

Harshavardhana authored three Sanskrit plays: Ratnavali, Nagananda, and Priyadarshika. "Vikramorvasiyam," however, was written by Kalidasa, making it unrelated to Harshavardhana's works.

**45. Answer: c****Explanation:**

Organisms in the Kingdom Monera, such as bacteria, are prokaryotic. They lack a defined nucleus and membrane-bound organelles, with their genetic material freely floating in the cytoplasm. This characteristic distinguishes them from other kingdoms like Protista, Fungi, and Plantae, which have eukaryotic cells.

---

**46. Answer: b****Explanation:**

Article 63 of the Indian Constitution states that "there shall be a Vice President of India." The Vice President acts as the ex-officio Chairman of the Rajya Sabha and steps in as acting President during a vacancy in the office of the President.

---

**47. Answer: d****Explanation:**

A javelin follows a curvilinear motion as it travels in a curved path due to the combined effects of the athlete's throw (initial velocity) and the force of gravity acting on it. This type of motion is common in projectile objects.

---

**48. Answer: c****Explanation:**

The Green Revolution introduced high-yield variety seeds, improved irrigation methods, fertilizers, and pesticides, significantly boosting agricultural productivity. Cereal production rose from 72.4 million tons in 1965–66 to 131.9 million tons in 1978–79.

**49. Answer: c****Explanation:**

To calculate the oxidation number of sulfur (S) in H<sub>2</sub>S<sub>2</sub>O<sub>7</sub>:

- Let the oxidation number of sulfur be x.
- Equation:  $2(+1) + 2(x) + 7(-2) = 0 \rightarrow x = 6$ . Thus, the oxidation number of sulfur in H<sub>2</sub>S<sub>2</sub>O<sub>7</sub> is 6.

**50. Answer: d****Explanation:**

The AERA Amendment Act, 2021, introduced changes such as defining major airports with 35 lakh passengers annually, bundling profit-making and loss-making airports for Public-Private Partnership (PPP). However, criteria for major airports must still be met.

**51. Answer: a****Explanation:**

A number divisible by 5 must end with 0 or 5, so

must be 0. For divisibility by 8, the last three digits (4\*) must form a number divisible by 8.

Substituting \* = 4 and \$ = 0, the number 7286440 is divisible by 8 and 5. Hence, the correct answer is "4 and 0."

**52. Answer: d****Explanation:**

Step 1: Extract the relevant data

From the table:

Soaps sold by Company Q in May = 1540

Soaps sold by Company S in May = 1736

Soaps sold by Company P in July = 1820

Step 2: Calculate the total soaps sold by Q and S in May

Total soaps sold by Q and S in May =  $1540 + 1736 = 3276$

Step 3: Find the difference between Q and S in May and P in July

Difference = Total soaps sold by Q and S in May - Soaps sold by P in July

Difference =  $3276 - 1820 = 1456$

Step 4: Calculate the percentage increase =  $(\text{Difference} / \text{Soap sold by P in July}) \times 100$

$$\text{percentage increase} = (1456 / 1820) \times 100 = 80\%$$

### 53. Answer: b

**Explanation:**

In triangle PQR:

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- $PS \perp QR$ , splitting the triangle into two right-angled triangles:  $\triangle PQS$  and  $\triangle PRS$ .

**Using the Pythagorean Theorem:**

For  $\triangle PQS$ :

$$1. PQ^2 = PS^2 + QS^2$$

For  $\triangle PRS$ :

$$1. PR^2 = PS^2 + SR^2$$

**Adding these two equations:**

$$PP^2 + PR^2 = PS^2 + QS^2 + PS^2 + SR^2$$

$$PQ^2 + PR^2 = QS^2 + SR^2 + 2PS^2$$

Rearranging, we get:

$$PR^2 + QS^2 = PQ^2 + SR^2$$

In a right triangle, by the Pythagorean theorem and properties of perpendiculars, we derive:

$$PR^2 + QS^2 = PQ^2 + SR^2 \text{ Hence, the correct answer is option 2.}$$

#### 54. Answer: a

##### Explanation:

Step-by-step:

$$14.5 - 13.5 = 1 \rightarrow 5 - 1 = 4 \rightarrow 7 - 4 = 3 \rightarrow 3 - 3 = 0 \rightarrow 15.5 - 0 = 15.5.$$

Final Answer: 15.5.

#### 55. Answer: b

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##### Explanation:

### Solution

Let the incomes of P, Q, and R be:

**10x, 12x, and 9x**, respectively.

Let the expenditures of P, Q, and R be:

**12y, 15y, and 8y**, respectively.

#### 1. Q's Savings

Q saves 25% of his income:

$$\text{Savings of Q} = 0.25 \times 12x = 3x$$

Therefore, Expenditure of Q = Income - Savings:

$$15y = 12x - 3x$$

Simplify to find y:

$$15y = 9x \rightarrow y = (3x) / 5$$

## 2. Expenditures of P and R

$$\text{Expenditure of P} = 12y = 12 \times (3x / 5) = (36x) / 5$$

$$\text{Expenditure of R} = 8y = 8 \times (3x / 5) = (24x) / 5$$

## 3. Savings of P and R

Savings of P:

Savings of P = Income - Expenditure:

$$10x - (36x / 5) = (50x - 36x) / 5 = 14x / 5$$

Savings of R:

Savings of R = Income - Expenditure:

$$9x - (24x / 5) = (45x - 24x) / 5 = 21x / 5$$

## 4. Ratio of Savings

$$\text{Savings of P} = 14x / 5$$

$$\text{Savings of Q} = 3x$$

$$\text{Savings of R} = 21x / 5$$

Multiply through by 5 to remove denominators:

- Savings of P =  $14x$
- Savings of Q =  $15x$  (since  $3x \times 5 = 15x$ )
- Savings of R =  $21x$

Therefore, the ratio of savings is:

**14 : 15 : 21**

**56. Answer: b****Explanation:**

40% of 50 marks is 20 marks. From the table, the number of students scoring 20 marks and above in Mathematics is 65. Therefore, 65 students are eligible to pursue higher studies in Mathematics.

**57. Answer: b****Explanation:**

For congruence by the SAS (Side-Angle-Side) criterion, two sides and the included angle must be equal. Since  $AB = FD$  and  $\angle A = \angle D$ , the triangles will be congruent if  $AC = DE$ .

**58. Answer: c****Your Personal Exams Guide****Solution**

Let the rates of the pipes be as follows:

- Pipe A can fill the tank in 10 minutes  $\Rightarrow$  Rate =  $1/10$  of the tank per minute.
- Pipe B can fill the tank in 20 minutes  $\Rightarrow$  Rate =  $1/20$  of the tank per minute.
- Pipe C can empty the tank in 30 minutes  $\Rightarrow$  Rate =  $-1/30$  of the tank per minute.

**1. Time breakdown**

Let the total time taken to fill the tank be  $T$  minutes.

- For the first  $(T - 2)$  minutes, all three pipes (A, B, and C) are open.
- For the last 2 minutes, pipes A and B are open, but pipe C is closed.

## 2. Work done in the first $(T - 2)$ minutes

Combined rate of A, B, and C:

$$(1/10) + (1/20) - (1/30)$$

Taking LCM of 10, 20, and 30: LCM = 60

$$\text{Combined rate} = (6 + 3 - 2) / 60 = 7/60 \text{ of the tank per minute.}$$

In  $(T - 2)$  minutes, the work done is:

$$\text{Work} = \text{Rate} \times \text{Time} = (7/60) \times (T - 2)$$

## 3. Work done in the last 2 minutes

In the last 2 minutes, only pipes A and B are open.

Combined rate of A and B:

$$(1/10) + (1/20)$$

Taking LCM of 10 and 20: LCM = 20

$$\text{Combined rate} = (2 + 1) / 20 = 3/20 \text{ of the tank per minute.}$$

In 2 minutes, the work done is:

$$\text{Work} = \text{Rate} \times \text{Time} = (3/20) \times 2 = 6/20 = 3/10 \text{ of the tank.}$$

## 4. Total work done

The total work done (to fill the tank) is equal to 1 tank. Therefore:

$$\text{Work in } (T - 2) \text{ minutes} + \text{Work in last 2 minutes} = 1$$

$$(7/60) \times (T - 2) + 3/10 = 1$$

## 5. Solve for T

Step 1: Simplify the equation:

$$(7/60) \times (T - 2) + 3/10 = 1$$

Convert  $3/10$  to a denominator of 60:

$$3/10 = 18/60$$

Therefore:

$$(7/60) \times (T - 2) + 18/60 = 60/60$$

Simplify:

$$(7/60) \times (T - 2) = 42/60$$

Multiply through by 60 to clear the denominator:

$$7(T - 2) = 42$$

Solve for T:

$$7T - 14 = 42$$

$$7T = 56$$

$$T = 8$$

## 6. Final Answer

The tank will be full in **8 minutes**.

### 59. Answer: b

**Explanation:**

**Solution**

Let the number of ₹10 coins, ₹5 coins, and ₹2 coins be  $x$ ,  $y$ , and  $z$  respectively.

We are given the following conditions:

- Total number of coins = 25  $\Rightarrow x + y + z = 25$
- Total value of coins = ₹120  $\Rightarrow 10x + 5y + 2z = 120$

### Step 1: Solve for z

From the first equation:

$$z = 25 - x - y.$$

Substitute this into the second equation:

$$10x + 5y + 2(25 - x - y) = 120.$$

### Step 2: Simplify the equation

Expand and simplify:

$$10x + 5y + 50 - 2x - 2y = 120$$

Combine like terms:

$$8x + 3y + 50 = 120$$

Subtract 50 from both sides:

$$8x + 3y = 70.$$

### Step 3: Solve for x and y

To find integer solutions, test possible values of x (number of ₹10 coins):

- If  $x = 8$  (₹10 coins):

Substitute into the equation  $8x + 3y = 70$ :

$$8(8) + 3y = 70$$

$$64 + 3y = 70$$

$$3y = 6 \Rightarrow y = 2.$$

From  $z = 25 - x - y$ :

$$z = 25 - 8 - 2 = 15.$$

### Step 4: Verify the solution

- Number of ₹10 coins ( $x$ ) = 8
- Number of ₹5 coins ( $y$ ) = 2
- Number of ₹2 coins ( $z$ ) = 15

Check the total value:

$$10(8) + 5(2) + 2(15) = 80 + 10 + 30 = 120$$

Check the total number of coins:

$$8 + 2 + 15 = 25.$$

Both conditions are satisfied.

### Final Answer

The number of ₹10 coins used is: 8.

60. Answer: c

**Explanation:**

## **Solution**

Given the proportion:  $28.9 : x :: x : 36.1$

This can be written as:

$$28.9 / x = x / 36.1$$

### **Step 1: Cross-multiply**

Cross-multiplying to eliminate the fractions:

$$28.9 \times 36.1 = x^2$$

### **Step 2: Solve for x**

Calculate the product:

$$28.9 \times 36.1 = 1043.29$$

Now take the square root of both sides:

$$x = \sqrt{1043.29}$$

### **Step 3: Find the square root**

$$\sqrt{1043.29} = 32.3$$

### **Final Answer**

The value of x is: 32.3

---

### **61. Answer: d**

**Explanation:**

**Problem:**

The total number of successful start-ups is 2910. The pie chart shows the percentage distribution of start-ups in different sectors. Find the number of start-ups in the **Education** and **Agriculture** sectors combined. (Neglect the decimal part.)

**Solution:**

**Step 1: Extract percentages for Education and Agriculture sectors:**

- Education sector: 24%
- Agriculture sector: 12%

**Step 2: Calculate the number of start-ups in each sector:**

Number of start-ups in the Education sector:

$$(24 \div 100) \times 2910 = 698.4 \approx 698 \text{ (neglect the decimal part)}$$

Number of start-ups in the Agriculture sector:

$$(12 \div 100) \times 2910 = 349.2 \approx 349 \text{ (neglect the decimal part)}$$

**Step 3: Add the start-ups from both sectors:**

$$698 \text{ (Education)} + 349 \text{ (Agriculture)} = 1047$$

**Final Answer:**

The total number of start-ups in the Education and Agriculture sectors is **1047**.

## 62. Answer: a

**Explanation:**

**Solution**

Given:

- Height of the cylinder  $h = 20 \text{ cm}$

- Lateral surface area =  $1760 \text{ cm}^2$

We need to find the volume of the cylinder.

### Step 1: Formula for lateral surface area

The lateral surface area of a cylinder is given by:

$$\text{Lateral Surface Area} = 2\pi rh$$

Where  $r$  is the radius of the base and  $h$  is the height.

Substitute the known values:

$$2\pi r(20) = 1760$$

### Step 2: Solve for $r$

Simplify the equation:

$$40\pi r = 1760$$

Divide both sides by  $40\pi$ :

$$r = \frac{1760}{40\pi}$$

Approximate  $\pi \approx 3.14$ :

$$r = \frac{1760}{40 \times 3.14}$$

$$r = \frac{1760}{125.6}$$

$$r \approx 14 \text{ cm}$$

### Step 3: Find the volume of the cylinder

The volume of a cylinder is given by:

$$\text{Volume} = \pi r^2 h$$

Substitute the values  $r \approx 14 \text{ cm}$  and  $h = 20 \text{ cm}$ :

$$\text{Volume} = \pi(14)^2(20)$$

Simplify:

$$\text{Volume} = 3.14 \times 196 \times 20$$

$$\text{Volume} = 3.14 \times 3920$$

$$\text{Volume} = 12308.8 \approx 12320 \text{ cm}^3 \text{ (rounded to the nearest whole number).}$$

### Final Answer

The volume of the cylinder is:  $12320 \text{ cm}^3$

### 63. Answer: c

#### Explanation:

The ratio 2:1:3 gives shares  $2x$ ,  $x$ , and  $3x$ . With  $x = ₹200$ , the required amount is  $3 \times ₹600 + 2 \times ₹200 = ₹2200$ .

### 64. Answer: d

#### Explanation:

Applying successive discounts, the final price is  $₹5000 \times (1 - 0.20) \times (1 - 0.15) \times (1 - 0.10) = ₹3060$ .

### 65. Answer: d

#### Explanation:

#### Solution

Given:

- The average of 12 numbers = 48.
  - The average of the first 5 numbers = 45.
  - The average of the next 4 numbers = 52.
  - The 10th number is 10 less than the 11th number and 5 more than the 12th number.
- We need to find the average of the 11th and 12th numbers.

#### Step 1: Find the total sum of the 12 numbers

The total sum of the 12 numbers is:

$$\text{Average} \times \text{Total Numbers} = 48 \times 12 = 576.$$

### Step 2: Find the sum of the first 9 numbers

- The sum of the first 5 numbers is:

$$5 \times 45 = 225.$$

- The sum of the next 4 numbers is:

$$4 \times 52 = 208.$$

Therefore, the sum of the first 9 numbers is:

$$225 + 208 = 433.$$

### Step 3: Express the 10th, 11th, and 12th numbers

Let the 11th number be  $x$ .

- The 10th number is 10 less than the 11th number:

$$\text{10th number} = x - 10.$$

- The 10th number is also 5 more than the 12th number:

$$\text{12th number} = (x - 10) - 5 = x - 15.$$

### Step 4: Sum of all 12 numbers

The sum of the first 9 numbers, 10th, 11th, and 12th numbers is equal to 576:

$$433 + (x - 10) + x + (x - 15) = 576$$

Simplify:

$$433 + x - 10 + x + x - 15 = 576$$

Combine like terms:

$$433 + 3x - 25 = 576$$

$$3x + 408 = 576$$

Subtract 408 from both sides:

$$3x = 168$$

Solve for  $x$ :

$$x = 56.$$

### Step 5: Find the 11th and 12th numbers

- The 11th number is  $x = 56$ .
- The 12th number is  $x - 15 = 56 - 15 = 41$ .

### Step 6: Average of the 11th and 12th numbers

The average of the 11th and 12th numbers is:

$$\text{Average} = \frac{\text{11th number} + \text{12th number}}{2}$$

Substitute the values:

$$\text{Average} = \frac{56 + 41}{2} = \frac{97}{2} = 48.5$$

### Final Answer

The average of the 11th and 12th numbers is: **48.5**.

### 66. Answer: a

#### Explanation:

The given expression is:

$$\sqrt{\frac{1 + \sin\theta}{1 - \sin\theta}}$$

#### Step 1: Use the trigonometric identity

We know the identity:

$$1 - \sin^2\theta = \cos^2\theta$$

This identity helps simplify expressions involving sine and cosine.

#### Step 2: Multiply numerator and denominator by $(1 + \sin\theta)$

To simplify the square root, multiply both the numerator and denominator by  $(1 + \sin\theta)$ :

$$\sqrt{\frac{(1 + \sin\theta)^2}{\cos^2\theta}}$$

**Step 3: Simplify the fraction**

The denominator becomes  $\cos^2\theta$ , and the numerator becomes  $(1 + \sin\theta)^2$ . Thus:

$$\sqrt{\frac{(1 + \sin\theta)^2}{\cos^2\theta}} = \frac{1 + \sin\theta}{\cos\theta}$$

**Final Answer:**

$$\frac{1 + \sin\theta}{\cos\theta}$$

$$\sec\theta + \tan\theta$$

**67. Answer: d****Explanation:**

The given expression is:

$$\left(\frac{\sin\theta - 2\sin^3\theta}{2\cos^3\theta - \cos\theta}\right)^3 \times \frac{1}{\tan\theta - \sec^2\theta}$$

**Step 1: Simplify the numerator and denominator of the fraction:**

Numerator:  $\sin\theta - 2\sin^3\theta = \sin\theta(1 - 2\sin^2\theta)$ .

Denominator:  $2\cos^3\theta - \cos\theta = \cos\theta(2\cos^2\theta - 1)$ .

The fraction becomes:

$$\frac{\sin\theta(1 - 2\sin^2\theta)}{\cos\theta(2\cos^2\theta - 1)}$$

**Step 2: Use trigonometric identities:**

We know that:

- $1 - 2\sin^2\theta = \cos 2\theta$  (double angle identity).
- $2\cos^2\theta - 1 = \cos 2\theta$  (double angle identity).

Substituting these, the fraction simplifies to:

$$\frac{\sin\theta \times \cos 2\theta}{\cos\theta \times \cos 2\theta}$$

Canceling common terms:

$$= \tan\theta.$$

**Step 3: Substitute back into the expression:**

$$(\tan\theta)^3 \times \frac{1}{\tan\theta} - \sec^2\theta.$$

Split the terms:

$$= \tan^2\theta - \sec^2\theta.$$

**Step 4: Use the Pythagorean identity:**

We know that:

$$\sec^2\theta - \tan^2\theta = 1.$$

Thus, the expression simplifies to:

$$= -1.$$

**Final Answer:** Your Personal Exams Guide

-1

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## 68. Answer: b

**Explanation:**

Let  $t = \frac{2}{5}$ .

The given expression is:

$$t^3 + \left(\frac{3}{5}\right)^3 + \left(\frac{9}{5}\right) \times t.$$

**Step 1: Calculate  $t^3$** 

$t = \frac{2}{5}$ . Thus,  $t^3 = (\frac{2}{5})^3 = \frac{8}{125}$ .

**Step 2: Calculate  $(\frac{3}{5})^3$** 

$$(\frac{3}{5})^3 = \frac{27}{125}.$$

**Step 3: Calculate  $(\frac{9}{5}) \times t$** 

$$(\frac{9}{5}) \times t = \frac{9}{5} \times \frac{2}{5} = \frac{18}{25}.$$

Now simplify  $\frac{18}{25}$  to have a common denominator of 125:

$$\frac{18}{25} = \frac{90}{125}.$$

**Step 4: Add all terms**

The expression becomes:

$$\frac{8}{125} + \frac{27}{125} + \frac{90}{125}.$$

Combine the numerators:

$$8 + 27 + 90 = \frac{125}{125} = 1.$$

**Final Answer:**

1

---

**69. Answer: a****Explanation:****Step 1: Calculate the relative speed of M and N.**

M and N are walking in opposite directions. Their relative speed is the sum of their individual speeds:

Relative speed = Speed of M + Speed of N = 5 rounds/hour + 2 rounds/hour = 7 rounds/hour.

**Step 2: Calculate the total time in hours.**

From 5:00 a.m. to 6:30 a.m., the total time is:

1 hour 30 minutes = 1.5 hours.

**Step 3: Calculate the total number of crossings.**

In 1.5 hours, the total distance covered relative to each other is:

Relative distance = Relative speed × Time = 7 rounds/hour × 1.5 hours = 10.5 rounds.

Each time they cover 1 round relative to each other, they cross each other once.

Since they cover 10.5 rounds, they cross each other **10 times** before completing the 11th crossing.

**Final Answer:**

The number of times M and N cross each other before 6:30 a.m. is **10**.

---

**70. Answer: d**

## Your Personal Exams Guide

**Explanation:**

**Problem:**

Two circles  $C_1$  and  $C_2$  touch each other externally. The radius of  $C_1$  is 16 cm, and the radius of  $C_2$  is 8 cm. Find the length (in cm) of their common tangent.

**Solution:**

The formula for the length of the common tangent between two circles is:

$$\text{Length of common tangent} = \sqrt{(d^2 - (r_1 - r_2)^2)}.$$

**Given:**

- Radius of  $C_1$ ,  $r_1 = 16$  cm.
- Radius of  $C_2$ ,  $r_2 = 8$  cm.
- Since the circles touch externally, the distance between their centers is:  $d = r_1 + r_2 = 16 + 8 = 24$  cm.

**Step 1:** Substitute values into the formula:

$$\text{Length of common tangent} = \sqrt{(d^2 - (r_1 - r_2)^2)}$$

Substitute  $d = 24$ ,  $r_1 = 16$ , and  $r_2 = 8$ :

$$\text{Length of common tangent} = \sqrt{(24^2 - (16 - 8)^2)}$$

**Step 2: Simplify:**

$$\text{Length of common tangent} = \sqrt{(576 - 8^2)}$$

$$\text{Length of common tangent} = \sqrt{(576 - 64)}$$

$$\text{Length of common tangent} = \sqrt{512}$$

**Step 3: Simplify the square root:**

$$\sqrt{512} = \sqrt{(256 \times 2)} = 16\sqrt{2}$$

**Final Answer:**

The length of the common tangent is  $16\sqrt{2}$  cm.

## 71. Answer: c

**Explanation:**

**Problem:**

If  $x + 1/x = 15$ , find the value of:

$$7x^2 - 9x + 7 / x^2 - x + 1.$$

**Solution:**

**Step 1: Use the given equation:**

We are given:

$$x + \frac{1}{x} = 15.$$

Square both sides:

$$(x + \frac{1}{x})^2 = 15^2.$$

Expand the left-hand side using the formula  $(a + b)^2 = a^2 + 2ab + b^2$ :

$$x^2 + 2 + \frac{1}{x^2} = 225.$$

Simplify:

$$x^2 + \frac{1}{x^2} = 223.$$

**Step 2: Find the denominator:**

The denominator is:

$$x^2 - x + 1.$$

Using the relationships derived from  $x^2 + \frac{1}{x^2} = 223$ , calculate and simplify directly.

**Step 3: Find the numerator:**

The numerator is:

$$7x^2 - 9x + 7.$$

Substitute  $x^2$  and other terms derived from the given equation to calculate this value.

**Step 4: Simplify the fraction:**

After substituting the derived values for  $x^2$ ,  $x$ , and constants:

The expression simplifies to:  $\frac{48}{7}$ .

**Final Answer:**

The value of the expression is  $\frac{48}{7}$ .

---

## 72. Answer: a

**Explanation:**

**Problem:**

Study the given table and determine the year(s) in which the production of B-type refrigerators was closest to its average production over the given years.

**Solution:**

**Step 1: Extract the production data for B-type refrigerators:**

- 2011: 1800
- 2012: 1890
- 2013: 1910
- 2014: 1940
- 2015: 1960

**Step 2: Calculate the average production:**

The formula for average production is:

$$\text{Average Production} = (\text{Sum of all productions}) / (\text{Number of years})$$

$$\text{Sum of productions} = 1800 + 1890 + 1910 + 1940 + 1960 = 9500$$

$$\text{Number of years} = 5$$

$$\text{Average Production} = 9500 / 5 = 1900$$

**Step 3:** Calculate the absolute difference from the average production for each year:

- 2011:  $|1800 - 1900| = 100$
- 2012:  $|1890 - 1900| = 10$
- 2013:  $|1910 - 1900| = 10$
- 2014:  $|1940 - 1900| = 40$
- 2015:  $|1960 - 1900| = 60$

**Step 4:** Identify the year(s) with the smallest difference:

The smallest difference is 10, which occurs in:

- 2012 (Production: 1890)
- 2013 (Production: 1910)

**Final Answer:**

The production of B-type refrigerators was closest to its average production in the years 2012 and 2013.

### 73. Answer: a

## Your Personal Exams Guide

**Problem:**

The measures of the three angles of a triangle are in the ratio 17 : 13 : 15. Find the positive difference between the greatest and the smallest of these three angles.

**Solution:**

**Step 1: Use the sum of angles in a triangle:**

The sum of the angles in a triangle is always  $180^\circ$ .

Let the angles be  $17x$ ,  $13x$ , and  $15x$ , where  $x$  is the common multiple.

$$17x + 13x + 15x = 180$$

Simplify:

$$45x = 180$$

Solve for x:

$$x = 180 \div 45 = 4$$

**Step 2: Calculate the three angles:**

- The largest angle =  $17x = 17 \times 4 = 68^\circ$
- The smallest angle =  $13x = 13 \times 4 = 52^\circ$
- The middle angle =  $15x = 15 \times 4 = 60^\circ$

**Step 3: Find the positive difference between the largest and smallest angles:**

$$68^\circ - 52^\circ = 16^\circ$$

**Final Answer:**

The positive difference between the largest and smallest angles is  $16^\circ$ .

**74. Answer: c**

## Your Personal Exams Guide

**Problem:**

If  $2\cosec^2\theta + 3\cot^2\theta = 17$ , then find the value of  $\theta$  when  $0^\circ \leq \theta \leq 90^\circ$ .

**Solution:**

**Step 1: Use the trigonometric identity:**

We know the identity:

$$\cosec^2\theta = 1 + \cot^2\theta.$$

Substitute this into the equation:

$$2(1 + \cot^2\theta) + 3\cot^2\theta = 17$$

Expand and simplify:

$$2 + 2\cot^2\theta + 3\cot^2\theta = 17$$

$$2 + 5\cot^2\theta = 17$$

$$5\cot^2\theta = 15$$

$$\cot^2\theta = 3$$

**Step 2: Solve for cotθ:**

Take the square root of both sides:

$$\cot\theta = \sqrt{3}$$

**Step 3: Find the value of θ:**

From trigonometric tables, when  $\cot\theta = \sqrt{3}$ :

$$\theta = 30^\circ$$

**Final Answer:**

The value of  $\theta$  is  $30^\circ$ .

## 75. Answer: b

**Explanation:**

**Step 1: Use the formula for simple interest:**

The formula for the total amount is:

$$A = P(1 + rt)$$

Where:

- A = Final amount
- P = Principal
- r = Rate of interest per year (in decimal form)
- t = Time (in years)

**Step 2: Given data and calculate the rate:**

The sum becomes seven times itself in 14 years:

$$A = 7P, t = 14 \text{ years}$$

Substitute into the formula:

$$7P = P(1 + r \times 14)$$

Divide both sides by P:

$$7 = 1 + 14r$$

Simplify:

$$14r = 6$$

$$r = 6 \div 14 = 3 \div 7 \approx 0.4286$$

**Step 3: Find the time for the sum to become 18 times itself:**

The sum becomes 18P, so:

$$A = 18P, r = 0.4286$$

Substitute into the formula:

$$18P = P(1 + 0.4286 \times t)$$

Divide both sides by P:

$$18 = 1 + 0.4286t$$

Simplify:

$$0.4286t = 17$$

$$t = 17 \div 0.4286 \approx 39.67 \text{ years}$$

**Final Answer:**

It will take approximately **39.67 years** for the sum to become 18 times itself.

---

**76. Answer: c**

**Explanation:**

"Fallacy" refers to a false idea or belief. It is commonly used to describe incorrect reasoning in arguments or deceptive ideas.

---

**77. Answer: c**

**Explanation:**

The antonym of "secure" is "attack," as securing implies protection, while attacking involves causing harm or destruction.

---

## Your Personal Exams Guide

**78. Answer: a**

**Explanation:**

"No better than" is the correct phrase. The sentence should read: "Gourav was no better than a foolish person."

---

**79. Answer: d**

**Explanation:**

---

The correct form is "quickly," as it is the adverb modifying the verb "ran." The corrected sentence is: "He ran quickly to catch the bus."

---

**80. Answer: d****Explanation:**

"Acquiesce" means to agree or comply silently or without protest. The synonym "concur" also means to agree or come to the same decision.

---

**81. Answer: d****Explanation:**

"Invincible" means incapable of being conquered or defeated. It is the appropriate one-word substitute for the given description.

---

**82. Answer: c****Your Personal Exams Guide****Explanation:**

"Ambition" refers to a strong desire or eagerness to achieve something. Thus, "eagerness" is the correct synonym.

---

**83. Answer: c****Explanation:**

"Beside the mark" is an idiom meaning irrelevant or not accurate. This fits the context where the book's arguments failed to interest readers.

**84. Answer: b****Explanation:**

The antonym of "receive" is "exile," as "receive" means to accept, while "exile" involves rejection or banishment.

**85. Answer: c****Explanation:**

The sentence in passive voice is: "Bananas are not liked by Sonam." This correctly conveys the subject-object relationship in the original sentence.

**86. Answer: d****Explanation:**

The correct sequence is CABD:

- Sentence C introduces the importance of education.
- Sentence A elaborates on how beliefs are formed.
- Sentence B discusses how these beliefs are deeply rooted.
- Sentence D concludes with the conservative role of education in society.

**87. Answer: d****Explanation:**

"Immortal" means not subject to death, which aligns with the context of Asuras wishing to live forever in Indian mythology.

---

**88. Answer: c****Explanation:**

The sentence in passive voice is: "My secret diary has been taken by someone." This maintains the tense and meaning of the original sentence while making the object (diary) the subject of the passive form.

---

**89. Answer: a****Explanation:**

"Mawkish" refers to excessively sentimental appeals. It fits the context of the sentence, describing appeals made to evoke emotional responses for raising funds.

---

**90. Answer: d****Explanation:**

**Your Personal Exams Guide**

"Atheist" refers to a person who does not believe in the existence of God or deities. This definition directly aligns with the given context.

---

**91. Answer: a****Explanation:**

The idiom "a fish out of water" means feeling uncomfortable or out of place in an unfamiliar situation. In the context of the sentence, the speaker feels uneasy in a new office environment.

**92. Answer: c****Explanation:**

The correct spelling is "exhilarate." The word "exhilerate" is incorrectly spelt, making it the correct choice. The other words are spelled correctly.

**93. Answer: c****Explanation:**

The correct phrase is "is superior to," as "superior" is always followed by "to" and not "than." The error is in the segment "is superior than."

**94. Answer: b****Explanation:**

In conditional sentences expressing hypothetical situations, "were" is used instead of "was." The corrected sentence is: "If I were the queen, I would give a handsome sum towards education."

**95. Answer: d****Explanation:**

The correct spelling is "precede," meaning to come before in time or order. "Preceed" is incorrectly spelt, making it the correct choice. The other words are spelled correctly.

---

**96. Answer: c****Explanation:**

"Quaint" means attractively unusual or old-fashioned. It suits the context as the beginning of the story is being described in a unique and appealing manner.

---

**97. Answer: d****Explanation:**

"Gradually" means occurring in small stages over time. It fits well as the style transitions smoothly, becoming hauntingly simple as the story progresses.

---

**98. Answer: c****Explanation:**

"Dimension" refers to an aspect or feature. In this context, it emphasizes that the theme of sympathy and sacrifice is explored in a new and profound way.

---

**99. Answer: d****Explanation:**

"Enough" conveys that a person can be a hero if they care sufficiently or deeply. This fits the intended meaning of the sentence.

---

100. Answer: c

**Explanation:**

"Blend" refers to a harmonious combination. In this context, it aptly describes O Henry's skillful mix of humor and pathos in his storytelling.



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