AFCAT-II

Air Force Common Admission Test

Solved Paper 2015

Held on 13-09-2015

Directions (Q. Nos. 1-3) *Read the following passage carefully and answer the questions given below it.*

Patience is better than wisdom: An ounce of patience is worth a pound of brains. All men praise patience, but few can practise it. It is a medicine which is good for all diseases, but it is not every garden that grows the herbs to make it with. Many people are born crying, live complaining and die disappointed.
They think every other person's burden to be light and their own feathers to be heavy as lead and yet if the truth were known, it is their fancy rather than their fate that makes things go so hard with them. Many would be well off than what they think of.

1. Which of the following is the most suitable explanation to the author's remark that an "ounce of patience is worth a pound of brains"?
   (a) Wisdom can only be attained by practising patience
   (b) Patience comes first, wisdom next
   (c) Patience is essential for every achievement in life
   (d) Without patience wisdom cannot be used properly

2. Which one is the most likely explanation, among the following, of the author's metaphorical statement that "it is not every garden that grows the herbs to make it with"?
   (a) Patience is a must for solving all our problems in life
   (b) Patience is a rare herb that cures all diseases .
   (c) Patience is virtue of a highest order
   (d) It is only a small number of people that are found observing patience in life

3. The writer's remarks, "They think every person's burden to be light and their own feathers to be as heavy as lead" is very significant. It means
   (a) They are always worried and dejected
   (b) They consider their own problems to be difficult to solve as compared with problems of other people
   (c) They feel that they alone face serious problems while others have a nice time
   (d) They remain very much worried about their own problem

Directions (Q. Nos. 4-9) *Select the most appropriate word from the options against each number.*

Life is an **(4)** series of challenges and opportunities to be seized. You have to plan for exercising the right career choices and **(5)** the right opportunities. Planned **(6)** rather than a hasty decision is **(7)** as far as your career is concerned. You need to **(8)** what occupational groups, **(9)** and type of organizations are suitable for you.

4. (a) enticing   (b) exciting
   (c) encharming   (d) enhancing

5. (a) catching   (b) offsetting
   (c) grabbing   (d) conceiving

6. (a) delay   (b) hindrance
   (c) application   (d) execution

7. (a) desirable   (b) deciphered
   (c) inevitable   (d) acceptable

8. (a) check   (b) classify
   (c) divide   (d) analyse

9. (a) specifications   (b) limitations
   (c) qualifications   (d) identification

Directions (Q. Nos. 10-13) *Choose the word which is nearest in meaning to the given word.*

10. Nebulous
    (a) Tiny   (b) Vague
    (c) Insignificant   (d) Inadequate

11. Debilitate
    (a) Weaken   (b) Attack
    (c) Surmount   (d) Destroy

12. Anathema
    (a) Religious Chant (b) Pun
    (c) Musical Subject (d) Curse

13. Penchant
    (a) Liking   (b) Eagerness
    (c) Disability   (d) Keenness

Directions (Q. Nos. 14-17) *Choose the word which is nearly opposite in meaning to the given word.*

14. Refractory
    (a) Refreshing   (b) Burdensome
    (c) Privileged   (d) Manageable

15. Insolent
    (a) Sullen   (b) Affable
    (c) Determined   (d) Rich

16. Acrimonious
    (a) Legal   (b) Severe
    (c) Cursive   (d) Harmonious

17. Sceptic
    (a) Cryptic   (b) Believer
    (c) Support   (d) Eminent

18. To hold something in leash
(a) To restrain
(b) To disappoint
(c) To dismiss
(d) To discourage

19. To talk through one's hat
(a) To speak fluently
(b) To talk nonsense
(c) To talk wisdom
(d) To speak at random

20. To throw up the sponge
(a) To surrender or give up a contest
(b) To offer a challenge
(c) To become utterly disappointed
(d) To maintain grit and enthusiasm until the end

21. To get into hot waters
(a) To be impatient
(b) To suffer a huge financial loss
(c) To get into trouble
(d) To be in a confused state of mind

22. (a) Dolorous
(b) Dolurous
(c) Doloreus
(d) Delorious

23. (a) Condiut
(b) Conduit
(c) Connduit
(d) Condeut

24. (a) Gragarious
(b) Gragerious
(c) Gregarious
(d) Grigareous

25. (a) Intrensic
(b) Intrinsic
(c) Entrensic
(d) Entrinsec

26. (a) Sepulchral
(b) Sepalchrle
(c) Sepalchral
(d) Sepulchrle

27. To flog a dead horse
(a) To act in a foolish way
(b) To waste one's efforts
(c) To revive interest in an old subject
(d) To revive old memories

28. A bull in a china shop
(a) A person who is very ugly but loves the beautiful things of life
(b) A person who takes a sadistic delight in harming innocent people
(c) A person who becomes too excited where no excitement is warranted
(d) A rough and clumsy person at a place where skill and care are required

29. The alpha and the omega
(a) The beginning and the end
(b) A nice act
(c) The stars and the Moon
(d) Very costly

30. A fool's errand
(a) A blunder
(b) An impossible task
(c) A useless undertaking
(d) None of these

31. Serena Williams defeated ...... to win the women's singles title of Australian Open 2015.
(a) Venus Williams
(b) Sania Mirza
(c) Maria Sharapova
(d) Ana Ivanovic

32. Vinod Mehta an eminent Indian journalist and founder editor-in-chief of 'Outlook' published his autobiography by the name of
(a) Lucknow Boy: A Memoir
(b) One Life is Not Enough
(c) Accidental Prime Minister
(d) The Substance and the Shadow

33. Which city will host the 2022 Common Wealth Games?
(a) Gold Coast, Australia
(b) Durban, South Africa
(c) Lusaka, Zambia
(d) Nairobi, Kenya

34. What is the name of 'Innovative Council' proposed in the Rail Budget 2015 to promote innovation?
(a) Rail Tech
(b) Sankalp
(c) Kayakalp
(d) Navachar

35. Which of the following Asian countries celebrates its Independence Day on 4th February?
(a) Sri Lanka
(b) Bahrain
(c) Cambodia
(d) Bangladesh

36. Animals active at night are called
(a) Diurnal
(b) Nocturnal
(c) Parasites
(d) Nacto-diurnal

37. Think-tank of Government of India that replaced Planning Commission on 01 January, 2015 is
(a) NITI Vakya
(b) NITI Dharma
(c) NITI Vajpayee
(d) NITI Aayog

38. The book, 'Born Again on the Mountain' is authored by
(a) Pooja Rani
(b) Arunima Sinha
(c) Bachendri Pal
(d) Urbashi Lal

39. The present Chairman of ISRO is
(a) MYS Prasad
(b) Shailesh Nayak
(c) AS Kiran Kumar
(d) K Radhakrishnan

40. Natural radioactivity was discovered by
(a) Marie Curie
(b) Earnest Rutherford
(c) Henry Bacquerel
(d) Enrico Fermi

41. Sir CV Raman was awarded Noble Prize for his work connected with which of the following phenomenon of radiation?
(a) Scattering
(b) Diffraction
(c) Interference
(d) Polarization

42. In which atmospheric layer are the communication satellites located?
(a) Stratosphere
(b) Ionosphere
(c) Troposphere
(d) Mesosphere

43. Who was the Viceroy when the Simon Commission visited India?
(a) Lord Chelmsford
(b) Lord Reading
(c) Lord Irwin
(d) Lord Wellington

44. Mahatma Gandhi left South Africa to return to India in
(a) 1911
(b) 1915
(c) 1917
(d) 1919

45. Todar Mal was associated with ...... in Akbar's durbar.
(a) music
(b) literature
(c) finance
(d) law Reforms

46. Lines joining places of equal temperature are called
(a) isotherms
(b) isohyets
(c) isomers
(d) isobars

47. Who has been awarded the Dada Saheb Phalke Award for the year 2014?
(a) Pran
(b) Shashi Kapoor
(c) Dilip Kumar
(d) Amitabh Bachchan

48. How many days Moon takes to revolve around the Earth?
(a) $26\frac{1}{3}$
(b) $27\frac{1}{3}$
(c) $28\frac{2}{3}$
(b) $29\frac{1}{2}$

49. Indian-American music composer, Ricky Kej has won the Grammy Award for the album
(a) In the Lonely Hour
(b) Morning Phase
(c) Beyonce
(d) Winds of Samsara

50. Recently tested Agni-V missile is capable of carrying nuclear payload of
(a) 1000 kg
(b) 1500 kg
(c) 2000 kg
(d) 2500 kg

51. The Russian name of INS Vikramaditya is
(a) Admiral Groshkov
(b) Admiral Gorbachev
(c) Admiral Nakhimov
(d) Admiral Petr Bezobrazov

52. A boat travels upstream from B to A and downstream from A to B in 3 h. If the speed of the boat in still water is 9 km/h and the speed of the current is 3 km/h, the distance between A and B is
(a) 9 km
(b) 10 km
(c) 11 km
(d) 12 km

53. A steamer moves with a speed of 4.5 km/h in still water to a certain upstream point and comes back to the starting point in a river which flows at 1.5 km/h. The average speed of steamer for the total journey is
(a) 12 km/h
(b) 9 km/h
(c) 6 km/h
(d) 4 km/h

54. A can do $\frac{1}{2}$ of a piece of work in 8 days while B can do $\frac{1}{3}$ of the same work in 8 days. In how many days can both do it together?
(a) 9.6
(b) 10.5
(c) 11.2
(d) 16

55. A does $\frac{1}{2}$ as much work as B and C does $\frac{1}{2}$ as much work as A and B together. If C alone can finish the work in 40 days, then together all will finish the work in
(a) 30 days
(b) $13\frac{1}{3}$ days
(c) 15 days
(d) 20 days

56. A train 150 m long is running with a speed of 68 km/h. In what time will it pass a man who is running at 8 km/h in the same direction in which the train is going?
(a) 8 s
(b) 8.5 s
(c) 9 s
(d) 9.5 s

57. A train covers a distance of 12 km in 10 min. If it takes 6 s to pass a telegraph post, the length of the train is
(a) 90 m
(b) 100 m
(c) 120 m
(d) 140 m

58. A's salary is 50% more than B's. How much per cent is B's salary less than A's?
(a) $63\frac{1}{4}\%$
(b) $43\frac{1}{4}\%$
(c) $53\frac{1}{3}\%$
(d) $33\frac{1}{3}\%$

59. The price of an item is decreased by 25%. What per cent increase must be done in new price to get the original price?
(a) $33\frac{1}{3}\%$
(b) $43\frac{3}{4}\%$
(c) $55\frac{2}{3}\%$
(d) $65\frac{1}{4}\%$

60. Anmol sold two items for ₹ 1000 each. On one, he gained 10% and on other, he lost 10%. How much did he gain or loss in the whole transaction?
(a) Profit 0.95%
(b) Loss 1%
(c) Profit 10%
(d) Loss 10%

61. If the selling price is doubled, the profit triples. The profit per cent is
(a) $66\frac{1}{3}\%$
(b) 150%
(c) 100%
(d) 90%

62. A man lent a sum of money at the rate of simple interest of 4%. If the interest for 8 yr is ₹ 340 less than the principal, the principal is
(a) ₹ 500
(b) ₹ 520
(c) ₹ 540
(d) ₹ 560

63. A sum was invested for 3 yr at simple interest at a certain rate. Had it been invested at 4% higher rate of interest, it would have fetched ₹ 600 more. The sum is
(a) ₹ 4000
(b) ₹ 4950
(c) ₹ 5000
(d) ₹ 5150

64. The average weight of 50 boys in a class is 45 kg. When one boy leaves the class, the average reduces by 100 g. Find the weight of the boy who left the class.
(a) 50 kg
(b) 50.8 kg
(c) 49 kg
(d) 49.9 kg

65. In a mixture of 35 L, the ratio of milk and water is 4 : 1. If 7 L of water is added to the mixture, the ratio of milk and water of the new mixture will be
(a) 2 : 1
(b) 1 : 2
(c) 4 : 5
(d) 5 : 4

Directions (Q. Nos. 66-70) *Each of these questions given below contains three elements. These elements may or may not have some inter-linkage. Each group of elements may fit into one of these diagrams at (a), (b), (c) and (d). You have to indicate the group of elements which correctly fits into the diagrams.*
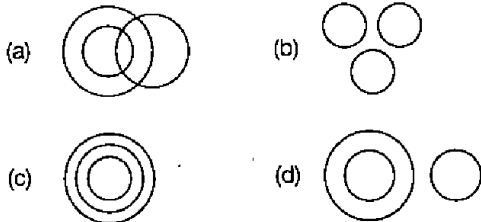
66. Which of the following diagrams indicates the best relation between Females, Doctors and Patients?
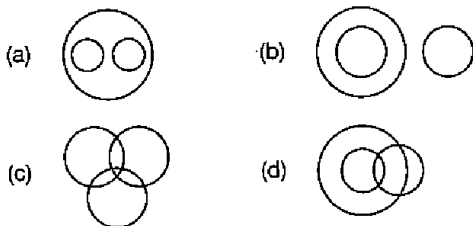
(a)
(b)
(c)
(d)
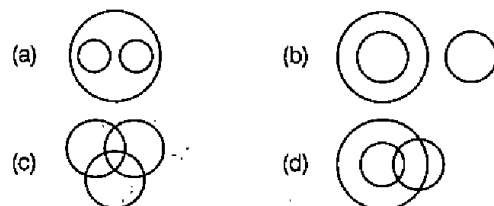
67. Which of the following diagrams indicates the best relation between Detectives, Spies and Men with Beards?

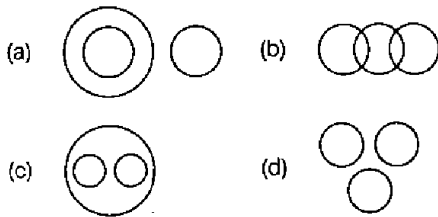(a)   (b)

(c)   (d)
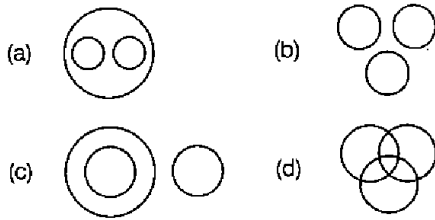
68. Which of the following diagrams indicates the best relation between Males, Fathers and Human Being?

(a)   (b)

(c)   (d)

69. Which of the following diagrams indicates the best relation between Steel, Wood and Building Material?

(a)   (b)

(c)   (d)

70. Which of the following diagrams indicates the best relation between Doctors, Teachers and Engineers?

(a)   (b)

(c)   (d)

Directions (Q. Nos. 71-75) *In each of the following questions find out the alternative which will replace the question mark.*

71. Blizzard : Freeze :: ?
(a) Insult : Humiliation
(b) Bad : Immoral
(c) Caution : Careless
(d) Jealousy : Respect

72. Graceful : Clumsy :: ?
(a) Horror : Sympathy
(b) Laugh : Cry
(c) Recapitulate : Synopsis
(d) Encumber : ˉ ırden

73. Zenith : Nadir :: ?
(a) Indigent : Poverty
(b) Zeal : Eagerness
(c) Success : Peak
(d) Genuine : Phony

74. Pedagogy : Teaching :: ?
(a) Telepathy : Emotions
(b) Radiology : Sound
(c) Mycology : Fossils
(d) Entomology : Insects

75. Capriciousness : Reliability :: ?
(a) Heated : Boiling
(b) Tenacious : Practicality
(c) Arbitrary : Whimsical
(d) Unreliable : Inhuman

Directions (Q. Nos. 76-80) *In each of the following questions, four words have been given out of which three are alike in some manner, while the fourth one is different. Choose the word which is different from the rest.*

76. (a) Niagara
(b) Alamere
(c) Kempty
(d) Andes

77. (a) Small Betrayals
(b) We Indians
(c) Shooting from the Hip
(d) Surviving Men

78. (a) Brass
(b) Bronze
(c) Silver
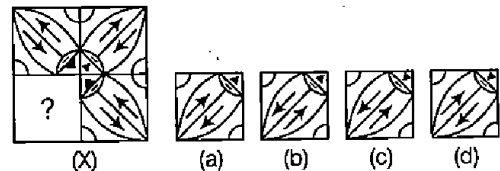(d) Steel

79. (a) Documentary
(b) Puppet
(c) Commentary
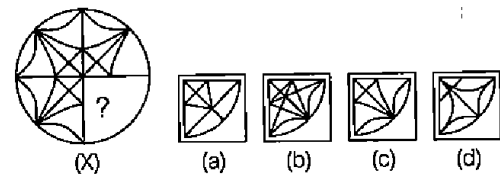(d) Feature

80. (a) Deccan
(b) Kaas
(c) Chhota Nagpur
(d) Nanda Devi

Directions (Q. Nos. 81-85) *In each of the following questions, select a figure from amongst the fou alternatives, which when placed in the blank space o figure (X) would complete the pattern.*
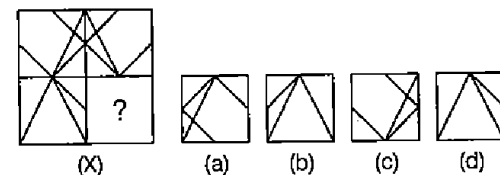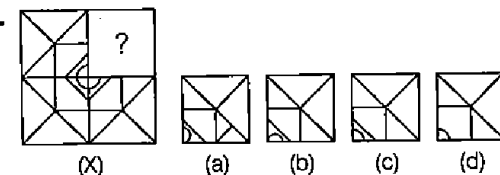
81. Problem Figure   Answer Figures
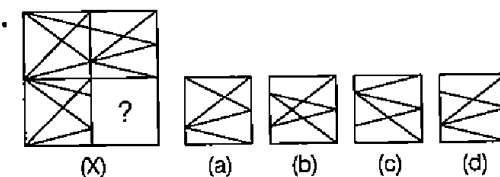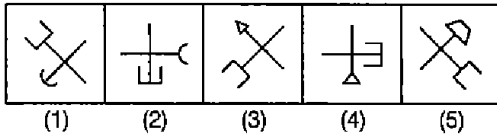

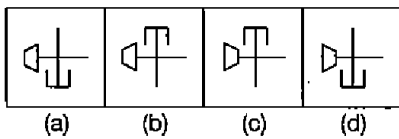**82.**

83.

84.

85.

Directions (Q. Nos. 86-90) *Each of the following questions consists of five figures marked 1, 2, 3, 4 and 5 called the problem figures followed by four other figures marked (a), (b), (c) and (d) called the answer figures. Select a figure from amongst the answer figures which will continue the same series as established by the five problem figures.*
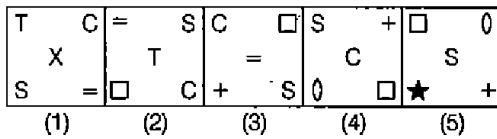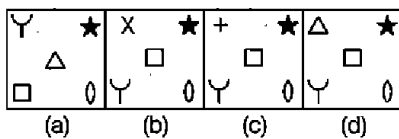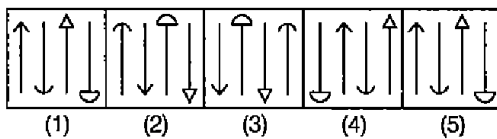
86. Problem Figures

(1) (2) (3) (4) (5)

Answer Figures

(a) (b) (c) (d)

87. Problem Figures

(1) (2) (3) (4) (5)

Answer Figures

(a) (b) (c) (d)

88. Problem Figures

(1) (2) (3) (4) (5)

Answer Figures

(a) (b) (c) (d).
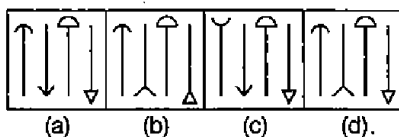
89. Problem Figures

(1) (2) (3) (4) (5)

Answer Figures

(a) (b) (c) (d)
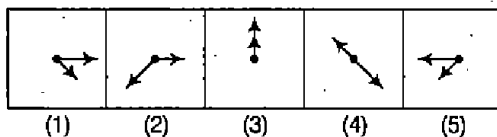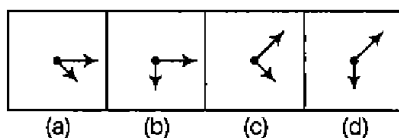
90. Problem Figures

(1) (2) (3) (4) (5)

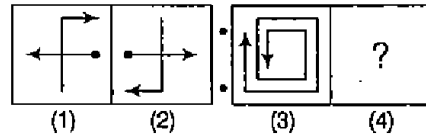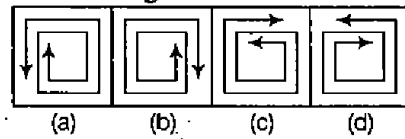**Answer Figures**

(a) (b) (c) (d)
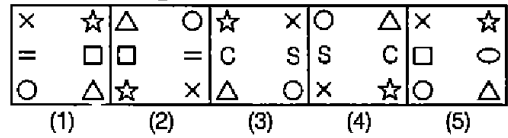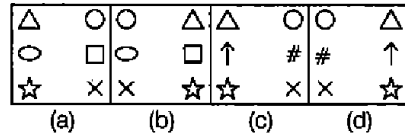
Directions (Q. Nos. 91-95) *Each of the following questions consists of two sets of figures. Figures 1, 2, 3 and 4 constitute the problem set while figures (a), (b), (c) and (d) constitute the answer set. There is a definite relationship between figures (1) and (2). Establish a similar relationship between figures (3) and (4) by selecting a suitable figure from the answer set that would replace the question mark (?) in fig.(4).*
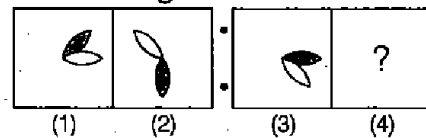
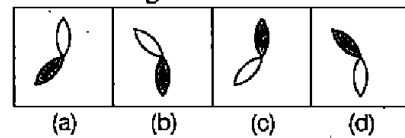**91. Problem Figures**

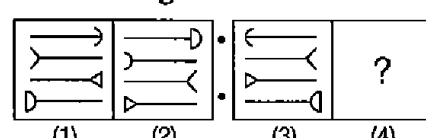(1) (2) (3) (4)

Answer Figures

(a) (b). (c) (d)

92. Problem Figures

(1) (2) (3) (4)

Answer Figures

(a) (b) (c) (d)

93. Problem Figures

(1) (2) (3) (4)

Answer Figures

(a) (b) (c) (d)
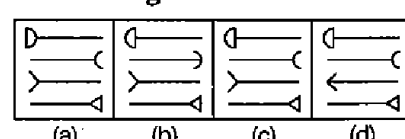
94. Problem Figures

(1)   (2)   (3)   (4)

Answer Figures

(a)   (b)   (c)   (d)
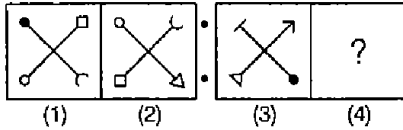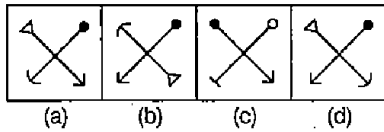
95. Problem Figures

(1)   (2)   (3)   (4)

Answer Figures

(a)   (b)   (c)   (d)
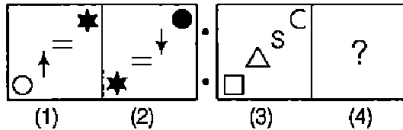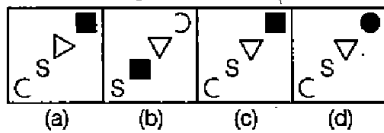
Directions (Q. Nos. 96-100) *In each problem, out of the four figures marked (a), (b), (c) and (d), three are similar in a certain manner. However, one figure is not like the other three. Choose the figure which is different from the rest.*

96.

(a)   (b)   (c)   (d)

97.

(a)   (b)   (c)   (d)

98.

(a)   (b)   (c)   (d)

99.

(a)   (b)   (c)   (d)

100.

(a)   (b)   (c)   (d)
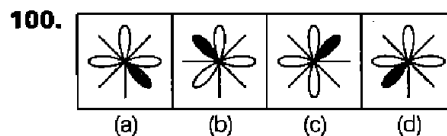
Answers

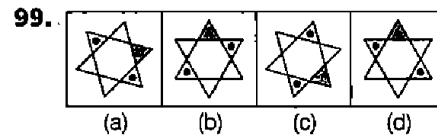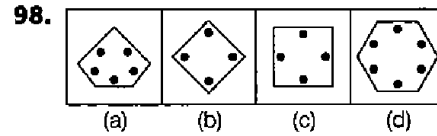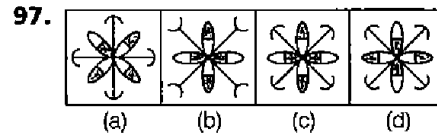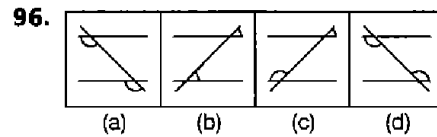|									
1. (d)	2. (d)	3. (c)	4. (b)	5. (c)	6. (d)	7. (a)	8. (d)	9. (a)	10. (b)
11. (a)	12. (d)	13. (a)	14. (d)	15. (b)	16. (d)	17. (b)	18. (a)	19. (b)	20. (a)
21. (c)	22. (a)	23. (b)	24. (c)	25. (b)	26. (a)	27. (b)	28. (d)	29. (a)	30. (c)
31. (c)	32. (a)	33. (b)	34. (c)	35. (a)	36. (b)	37. (d)	38. (b)	39. (c)	40. (c)
41. (a)	42. (b)	43. (c)	44. (b)	45. (c)	46. (a)	47. (b)	48. (b)	49. (d)	50. (b)
51. (a)	52. (d)	53. (d)	54. (a)	55. (b)	56. (c)	57. (c)	58. (d)	59. (a)	60. (b)
61. (c)	62. (a)	63. (c)	64. (d)	65. (a)	66. (c)	67. (d)	68. (c)	69. (a)	70. (b)
71. (a)	72. (b)	73. (d)	74. (d)	75. (b)	76. (d)	77. (b)	78. (c)	79. (c)	80. (d)
81. (d)	82. (c)	83. (b)	84. (c)	85. (d)	86. (c)	87. (a)	88. (a)	89. (d)	90. (a)
91. (b)	92. (a)	93. (d)	94. (d)	95. (c)	96. (c)	97. (a)	98. (b)	99. (d)	100. (b)

Hints and Solutions

1. 'Without patience wisdom cannot be used properly' is the most suitable explanation to the author's remark that "an ounce of patience is worth a pound of brains".

2. "It is not every garden that grows the herbs to make it with" means it is only a small number of people that are found observing patience in life.

3. The writer's remarks mean that they feel that they alone face serious problems while others have a nice time.

4. Exciting means 'causing great interest or excitement' which fits the blank appropriately.

5. Grab means 'to take advantage of an opportunity to do or have something.'

6. Execution means 'the act of doing a piece of work; putting into action'.

7. Desirable means 'that you would like to have or do'.

8. In the context of the passage 'analyse' fits the blank appropriately.

9. In the context of the passage all other options are irrelevant.

10. Nebulous means 'not clear; vague'.

11. Debilitate means 'to make weaker'.

12. Anathema means 'a thing or an idea which you hate because it is the opposite of what you believe; curse; ban.'

13. Penchant means 'liking; fondness'.

14. Refractory means 'difficult to control'.

15. Insolent means 'very rude; showing lack of respect'. Affable means 'pleasant and friendly'.

16. Acrimonious means 'angry and full of strong bitter feelings'.

17. Sceptic means 'one who doubts things which other people believe in'.

18. To hold something in leash means 'to keep under control; to restrain'.

19. To talk through one's hat means 'to say silly things; to talk nonsense'.

20. To throw up the sponge means 'to give up; to surrender'.

21. To get into hot waters means 'to be or to get into trouble'.

22. The correctly spelt word is 'dolorous'.

23. The correctly spelt word is 'conduit'.

24. The correctly spelt word is 'gregarious'.

25. The correctly spelt word is 'intrinsic'.

26. The correctly spelt word is 'sepulchral'.

27. To flog a dead horse means 'to waste one's efforts by trying to do something that is no longer possible.

28. A bull in a china shop means 'a rough and clumsy person at a place where skill and care are required'.

29. The alpha and the omega means 'the beginning and the end'.

30. A fool's errand means 'a task which has no hope of being done successfully.

31. Serena Williams defeated Maria Sharapova to win the women's single title of Australian Open 2015.

32. Vinod Mehta was an Indian journalist, editor and political commentator. He was also the founder editor-in-chief of Outlook from 1995 to 2012. His autobiography 'Lucknow Boy : A Memoir' was published in 2011.

33. The South African city of Durban has been selected as the host for the 2022 Commonwealth Games.

34. Kayakalp is the name of 'Innovation Council' proposed in the Rail Budget 2015 to promote innovation.

35. Sri Lanka's Independence Day is celebrated on 4th of February, in accordance with Lipass/Joshua Louis Law to commemorate its internal political independence from British rule on that day in 1948.

36. Animals active at night are called nocturnal. Nocturnality is an animal behaviour characterized by activity during the night and sleeping during the day.

37. The National Institution for Transforming India (NITI) Aayog is a Government of India policy think-tank established by Prime Minister Narendra Modi to replace the Planning Commission.

38. Prime Minister Narendra Modi on 12th December, 2014 launched a book title 'Born Again on the Mountain' by Arunima Sinha. She is the first Indian amputee and first female amputee to Climb Mount Everest.

39. Alur Seelin Kiran Kumar is the present Chairman of ISRO (Indian Space Research Organization).

40. Natural radioactivity was discovered by Henry Bacquerel. Natural radioactivity is the activity existing in nature. Spontaneous emission of particles or electromagnetic radiation or both from an unstable nucleus is labelled as radioactivity.

41. The Nobel Prize in Physics 1930 was awarded to Sri Chandrasekhar Venkata Raman "for his work on the scattering of light and for the discovery of the effect named after them".

42. The ionosphere is defined as the layer of the Earth's atmosphere that is ionized by solar and cosmic radiation. It has major important to us because among other functions, it influences radio propagation to distant places on the Earth and between satellites and Earth.

43. Simon commission visited India in 1928 to study constitutional reform in Britain's most important colonial dependency. In the year 1928, Lord Irwin was the Viceroy of India.

44. Mahatma Gandhi left South Africa to return to India in the year 1915.

45. Todar Mal was a Finance Minister in Akbar's durbar.

46. Lines joining places of equal temperature are called isotherms.

47. Shashi Kapoor has been awarded the Dada Saheb Phalke Award for the year 2014.

48. Moon takes $27\frac{1}{3}$ days to revolve around the Earth.

49. Indian-American music composer, Ricky Kej has won the Grammy Award for the album 'Winds of Samsara'.

50. Agni-V is an intercontinental ballistic missile developed by DRDO. It is capable of carrying a nuclear payload of 1500 kg. It has a range of 5500-5800 km.

51. INS Vikramaditya is a modified kiev-class aircraft carrier which entered into service with the Indian Navy in 2013. The Russian name of INS Vikramaditya is Admiral Groshkov.

52. Speed of boat $= x = 9$ km/h

Speed of stream of river $= y = 3$ km/h
Speed of boat in downstream $= 9 + 3 = 12$ km/h
Speed of boat in upstream $= 9 - 3 = 6$ km/h
Time taken by boat in upstream and downstream
$$= t_1 + t_2 = 3\,h$$
Let the distance covered by boat $= D$
$$\because \quad t_1 + t_2 = D\left(\frac{1}{12} + \frac{1}{6}\right) \quad \Rightarrow \quad 3 = D\left(\frac{1+2}{12}\right)$$
$$\Rightarrow \quad 3 = \frac{D \times 3}{12} \quad \therefore \quad D = 12\ km$$

53. Speed of steamer $= 4.5$ km/h
Speed of stream $= 1.5$ km/h
Speed of steamer in upstream
$$= 4.5 - 1.5 = 3\ km/h = V_1$$
Speed of steamer in downstream
$$= 4.5 + 1.5 = 6\ km/h = V_2$$
$$\therefore \text{Average speed} = \frac{2V_1V_2}{V_1 + V_2} = \frac{2 \times 3 \times 6}{3 + 6} = \frac{36}{9} = 4\ km/h$$

54. A's work of 8 days $= \frac{1}{2}$ part

A's work of 1 day $= \frac{1}{16}$ part

B's work of 8 days $= \frac{1}{3}$ part

B's work of 1 day $= \frac{1}{24}$ part

1 day work of A and $B = \frac{1}{16} + \frac{1}{24} = \frac{5}{48}$

So, the required days $= \frac{48}{5} = 9.6$ days

55. C's work of 1 day $= \dfrac{1}{40}$ part

$\therefore (A + B)$ work of 1 day $= \dfrac{1}{20}$ part

Therefore, 1 day work of A, B and C

$= \dfrac{1}{40} + \dfrac{1}{20} = \dfrac{1+2}{40} = \dfrac{3}{40}$ part

The required time $= \dfrac{1}{\frac{3}{40}} = \dfrac{40}{3} = 13\dfrac{1}{3}$ days

56. Length of train $= 150\,m$

Speed $= 68\,km/h = 68 \times \dfrac{5}{18} = 18.89\,m/s$

Speed of man $= 8\,km/h = 8 \times \dfrac{5}{18}\,m/s = 2.22\,m/s$

Relative speed of man + train $= 18.89 - 2.22$

$\qquad\qquad\qquad\qquad = 16.66\,m/s$

$\therefore$ The required time $= \dfrac{\text{Length of train}}{\text{Speed of train}} = \dfrac{15}{16.66} = 9\,s$

57. The train covers 12000 m in 600 s.

Speed of train $= \dfrac{12000}{600} = 20\,m/s$

Now, train takes 6 s to pass a telegraph post.

So, $6 = \dfrac{\text{Length of train}}{20}$

$\therefore$ Length $= 6 \times 20 = 120\,m$

Therefore, the length of train $= 120\,m$

58. The required percentage value $= \left(\dfrac{a}{100 + a} \times 100 \right)$

$= \left(\dfrac{50}{100 + 50} \times 100 \right) = \dfrac{50}{150} \times 100 = \dfrac{100}{3} = 33\dfrac{1}{3}\%$

59. The required percentage value $= \left(\dfrac{a}{100 - a} \times 100 \right)$

$= \left(\dfrac{25}{100 - 25} \times 100 \right) = \dfrac{25}{75} \times 100 = \dfrac{100}{3} = 33\dfrac{1}{3}\%$

60. In this case, the result will always be 1% loss.

61. If the selling price is doubled and the profit triples, then the profit per cent will be 100%.

62. Let the required sum is P.

$r = 4\%$, Time period $= 8\,yr$ (Given)

and interest $= P - 340$

Simple interest $= \dfrac{PTR}{100} \Rightarrow P - 340 = \dfrac{P \times 8 \times 4}{100}$

$\Rightarrow 100P - 34000 = P \times 32 \Rightarrow 68P = 34000$

$\therefore \qquad P = \dfrac{34000}{68} = ₹\,500$

63. Time $= 3\,yr$, $r = r_1\%$, Second rate $= (r_1 + 4)\%$

Interest $= ₹\,600$

$\because \qquad \dfrac{P \times 3\,(r_1 + 4)}{100} - \dfrac{P \times 3 \times r_1}{100} = 600$

$\Rightarrow \qquad \dfrac{3P\,(r_1 + 4) - 3Pr_1}{100} = 600$

$\Rightarrow \qquad 3Pr_1 + 12P - 3Pr_1 = 60000$

$\Rightarrow \qquad\qquad\qquad 12P = 60000$

$\therefore \qquad\qquad\qquad P = ₹\,5000$

64. Average of 50 students in a class $= 45\,kg$

Total weight $= 45 \times 50 = 2250\,kg = 2250000\,g$

Now, one boy leaves the class.

So, new average $= 44.9\,kg = 44900\,g$

Total weight of remaining students $= 44900 \times 49$

$\qquad\qquad\qquad\qquad\qquad = 2200100\,g$

Weight of student who left $= (2250000 - 2200100)\,g$

$\qquad\qquad\qquad\qquad = 49900\,g = 49.9\,kg$

65. Milk : Water $= 4 : 1$

Total quantity of given mixture $= 35\,L$

Milk $= \dfrac{4}{5} \times 35 = 28\,L$
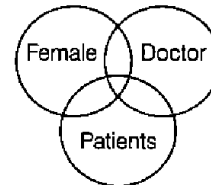
$\therefore$ Water $= 35 - 28 = 7\,L$

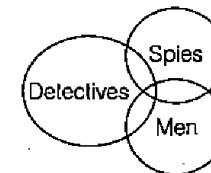Quantity of water in new mixture $= 7 + 7 = 14\,L$

Milk $= 28\,L$
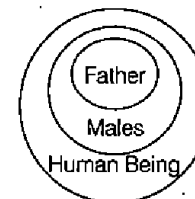
New ratio of milk and water $= 2 : 1$

66. The required relation between Female, Doctor and Patients is shown below
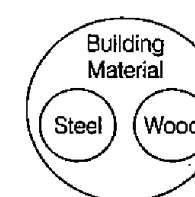

67. The required relation between Detectives, Spies and Men is shown below

68. The required relation between Males, Father and Human Being is shown below

69. The required relation between Steel, Wood and Building Material is shown below

70. The required relation between Doctors, Teachers and Engineers is shown below