AFCAT-I

AIR FORCE COMMON ADMISSION TEST

SOLVED PAPER 2020

MM : 300 **DURATION : 2 HRS**

INSTRUCTIONS

1. This question paper consists of 100 questions of 2 hrs duration.
2. Each question is of 3 marks.
3. For each wrong answer, 1 mark will be deducted.

Directions (Q. Nos. 1-4) *Each sentence in the below given questions has two blanks, each blank indicates that something has been omitted. Beneath the sentence are five words or sets of words. Choose the word or set of words for each blank that best fits into the meaning of the sentence as a whole.*

1. It is a well-known ..... that the lover of the sea craves for dry land, the age old ..... to be where we are not.
(a) belief, antipathy (b) anomaly, demiurge
(c) credo, inspiration (d) paradox, yearning

2. Such stalling tactics are ..... to all fans and cannot be ..... .
(a) repugnant, condoned (b) anathema, ascertained
(c) injurious, explained (d) unfair, superseded

3. The ..... of democratic freedom is dialogue and the ..... interchange of diverse ideas.
(a) deterioration, untrammeled
(b) height, restrained
(c) essence, unhampered
(d) alienation, compulsory

4. Although, there were ..... circumstances in this particular violation of the law, the judge ruled that there had to be strict ..... or there would be no law at all.
(a) extraordinary, complaisance
(b) specific, obedience
(c) tantalising, adherence
(d) extenuating, compliance

Directions (Q.Nos. 5-9) *Some parts of the sentences have errors and some are correct. Find out which part of a sentence has an error and blacken the oval [.] corresponding to the appropriate letter* (a), (b), (c). *If a sentence is free from error, blacken the oval corresponding to* (d) *in the Answer Sheet.*

5. I was *(a)*/ laying down *(b)*/ when the door bell rang. *(c)*/ No error *(d)*

6. I told the teacher *(a)*/ that the homework set for the day *(b)*/ was much too heavy for us to complete. *(c)*/ No error *(d)*

7. Someone, they don't know *(a)*/ who knocked at *(b)*/ their door in midnight. *(c)*/ No error *(d)*

8. Seldom if ever *(a)*/ nature does operate *(b)*/ in closed and separate compartments. *(c)*/ No error *(d)*

9. Mohan leapt *(a)*/ on the opportunity *(b)*/ that came his way. *(c)*/ No error *(d)*

Directions (Q. Nos. 10-13) *In these questions, four alternatives are given for the idiom / phrase. Choose the alternative which best expresses the meaning of the idiom / phrase.*

10. A damp squib
(a) Rainy weather
(b) A disappointing result
(c) A skirt in a laundry
(d) None of the above

11. To smell a rat
(a) To smell foul (b) To see a rat
(c) To chase a rat (d) To be suspicious

12. Yeoman's services
(a) Medical help (b) Excellent work
(c) Social work (d) Hard work

13. Flippant
(a) Highly critical
(b) Not showing deserved respect
(c) Casual
(d) Indifferent

Directions (Q. Nos. 14-16) *In these questions, you have two brief passages with 5 questions following each passage. Read the passages carefully and choose the best answer to each question out of the four alternatives.*

From the world of magic, hypnosis is moving into the world of medicine. From hocus-pocus performed by men in black capes, to hypnotherapy practised by doctors in white coats. The purpose is to help people stop smoking, lose weight, overcome phobias and control pain in a variety of medical situations from childbirth to cancer.

Research laboratories are currently checking out the success rate of therapy under hypnosis, while medical journals stand by to publish the results. And the important thing is, nobody is laughing.

In the 1840's, a British doctor in Calcutta created a controversy by performing over 1000 operations with hypnosis as the only anaesthesia. During the World Wars, German and British doctors used hypnosis to treat war neuroses.

14. Hypnosis means
(a) auto-suggestion
(b) suggestion made in trance
(c) anaesthesia
(d) hocus-pocus

15. 'Nobody is laughing' at hypnotherapy now, because they are
(a) sad (b) angry
(c) taking it seriously (d) annoyed

16. The purpose of hypnotherapy is to
(a) cure patients
(b) make life easier
(c) carry out research
(d) check out the success rate

Directions (Q. Nos. 17-19) *In these questions, choose the word similar in meaning to the word given.*

17. Barren
(a) Good (b) Wholesome
(c) Unproductive (d) Profitable

18. Infamy
(a) Notoriety (b) Glory
(c) Integrity (d) Familiarity

19. Intrepid
(a) Hesitant (b) Fearless
(c) Extrovert (d) Rash

Directions (Q. Nos. 20-22) *Choose the word opposite in meaning to the word given.*

20. Compassionate
(a) Unlawful (b) Heartless
(c) Untrustworthy (d) Indecisive

21. Tasty
(a) Delicious (b) Insipid
(c) Appetising (d) Palatable

22. Triumph
(a) Defeat (b) Victory
(c) Success (d) Subjugation

Directions (Q. Nos. 23-25) *Fill up the blanks in the passage given below with the most appropriate word from the options given for each blank.*

At the time, the White House was as serene as a resort hotel out of season. The corridors were ...(23)... in the various offices. ...(24)... gray men on waistcoats talked to one another in low-pitched voices. The only colour or choler, curiously enough, was provided by President Eisenhower himself. Apparently, his ...(25)... was easily set off; he scowled when he paced the corridors.

23. (a) striking (b) hollow
(c) empty (d) white

24. (a) Quiet (b) Faded
(c) Loud (d) Stentorian

25. (a) laughter (b) curiosity
(c) humour (d) temper

26. 'Vikalp' is a scheme launched by Indian Railways to help wait-listed passengers. Which of the following is not true about this scheme?
(a) Confirmed berths in alternate trains
(b) No-extra charges will be taken from passengers
(c) Wait-listed passengers can avail opportunity of travelling Rajdhani/Shatabdi/Special trains even when booking made is in other mail/express trains
(d) Vikalp scheme will be initially available for e-tickets only

27. Who discovered the Cholera causing germ?
(a) Filippo Pacini
(b) Robert Koch
(c) M Laveran
(d) Felix Hoffman

28. Match the following

	List I		List II
A.	Mithali Raj	1.	Hockey
B.	Poonam Rani	2.	3000 m Steeplechases
C.	Lalita Babar	3.	Cricket

Codes

	A	B	C		A	B	C
(a)	3	2	1	(b)	1	2	3
(c)	1	3	2	(d)	3	1	2

29. Who is the author of the book titled Citizen and Society?
(a) Pranab Mukherjee (b) Hamid Ansari
(c) Nandan Nilekani (d) Satyajit Ray

30. With which country India has recently signed a MoU for water conservation in India?
(a) France (b) Germany
(c) Israel (d) Bangladesh

31. Who built the Vijay Stambha Tower of victory in Chittorgarh?
(a) Maharana Pratap (b) Rana Kumbha
(c) Rana Sanga (d) Kunwar Durjan Singh

32. Who raised the slogan 'Swaraj is my birthright and I shall have it'?
(a) Mahatma Gandhi
(b) Subhash Chandra Bose
(c) Bal Gangadhar Tilak
(d) Lala Lajpat Rai

33. Auxiliary bud develops into which of the following part of the plant?
(a) Fruit (b) Leaf
(c) Branch (d) Roots

34. Xylem helps in transportation of which of the following?
(a) Food
(b) Water
(c) Nutrients
(d) Both food and water

35. Match the following

	List I (Revolution)		List II (Leader)
A.	Green Revolution	1.	Durgesh Patel
B.	White Revolution	2.	MS Swaminathan
C.	Pink Revolution	3.	Verghese Kurien

Codes

	A	B	C		A	B	C
(a)	3	2	1	(b)	2	3	1
(c)	1	2	3	(d)	1	3	2

36. Who shot dead John Saunders on 17th December, 1927?
(a) Bhagat Singh
(b) Mangal Pandey
(c) Sukhdev
(d) Bipin Chandra Pal Singh

37. Sardar Vallabhbhai Patel was the leader of .....
(a) Bhoodan Movement
(b) Rowlatt Satyagraha
(c) Bardoli Satyagraha
(d) Swadeshi Movement

38. Who amidst the following is a distinguished painter?
(a) Uday Shankar
(b) Sonal Mansingh
(c) Amrita Shergill
(d) Yamini Kirshnamurthy

39. Who among the following was awarded with Padma Shri 2017 in the field of Sports Hockey?
(a) Sardar Singh (b) PR Shreejesh
(c) Ramandeep Singh (d) Yuvraj Walmiki

40. Which of the following is the largest gland in human body?
(a) Thyroid (b) Liver
(c) Kidney (d) Pancreas

41. On which principle does the hydraulic lift works?
(a) Newton's law (b) Pascal's law
(c) Archimede's law (d) Joule's law

42. At what temperature (in degree celsius), the numerical values on Celsius and Fahrenheit scales become equal?
(a) –40 (b) 40
(c) 273 (d) –273

43. In MICR, what does 'I' stands for?
(a) Interactive (b) Information
(c) Ink (d) Instruction

44. What is the process of conversion of solid state directly to gaseous state called?
(a) Evaporation (b) Condensation
(c) Sublimation (d) Distillation

45. Which of the following is an Indian military decoration awarded for valour, courageous action or self-sacrifice away from the battlefield?
(a) Ashok Chakra
(b) Dada Saheb Phalke Awards
(c) Arjuna Award
(d) Padma Shri

46. Which nation will host the FIFA Men's World Cup to be held in the year 2018?
(a) Japan (b) South Korea
(c) China (d) Russia

47. In Microsoft Word, ... allows us to move selected paragraphs to the right.
(a) decrease indent (b) increase indent
(c) double indent (d) single indent

48. Blue Vitriol is another name for which of the following?
(a) Copper sulphate (b) Oxygen
(c) Copper (d) Magnesium oxide

49. ..... scheme by the Central Government will strength the bond between all the state, regions and products of India.
(a) Uday Desh Ka Aam Nagrik
(b) Urja Ganga
(c) Ek Bharat Shrestha Bharat
(d) Namami Ganga Yojana

50. The Union Government on 22nd May, 2016 appointed whom as the new Lieutenant Governor of the Union Territory (UT) of Puducherry?
(a) Kiran Bedi (b) Kalyan Singh
(c) Ram Naik (d) Mukul Sangma

51. Choose the word which is different from the other
(a) Leo (b) Equator
(c) Libra (d) Cancer

Directions (Q. Nos. 52-55) *In these questions, select the related letter / word / number from the given alternatives.*

52. Cataract : Eye : : Pneumonia : ?
(a) Brain (b) Ear
(c) Lungs (d) Nerves and Limbs

53. TTT : 777 : : RRR : ?
(a) 555 (b) 666
(c) 888 (d) 999

54. YAD : NUS : : ? : NOOM
(a) NTHIG (b) HIGIN
(c) GHTIN (d) THGIN

55. 7 : 24 : : ?
(a) 30 : 100 (b) 23 : 72
(c) 19 : 58 (d) 11 : 43

56. Akbar is standing facing East. After walking 15 m he turned left and walked 25 m. Then, he turned right and walked 10 m. Again, he turned right and walked 25 m. How far is he from his original position?
(a) 15 m (b) 20 m
(c) 25 m (d) 30 m

57. If in a certain code, TWENTY is written as 863985 and ELEVEN is written as 323039, how is TWELVE written in that code?
(a) 863203 (b) 863584
(c) 863903 (d) 863063

58. If the 25th of August in a year is Thursday, the number of Mondays in that month is
(a) 3 (b) 4
(c) 5 (d) 6

59. When coded OPTRRE reads as PORTER. In the same way, what does the following read as?
EROPTR
(a) ROPE (b) PROPER
(c) PORT (d) REPORT

Direction (Q. No. 60) *Two statements are given below followed by two Conclusions* I *and* II. *You have to consider statements to be true even, if they seem to be at variance from commonly known facts. You have to decide which of the given conclusions, if any, follow from the given statements. Indicate your answer.*

60. **Statements** No man is a donkey. Rahul is a man.
Conclusions I. Rahul is not a donkey.
II. All men are not Rahul.
(a) Only I follows
(b) Only II follows
(c) Both follow
(d) Neither I nor II follows

Direction (Q. Nos. 61) *Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?*

61. ab__d__aaba__na__badna__b
(a) andaa (b) babda
(c) badna (d) dbanb

62. Below two positions of a dice are shown. What will be on opposite of the face at which 1 is written?

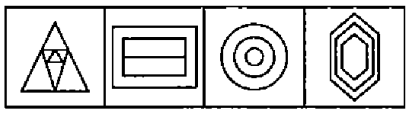
(a) 2 (b) 3
(c) 4 (d) 1

63. A statement with two assumptions are given followed by four alternatives. Select the one which is most appropriate.
Statement Nobody can predict as to how long our country would take to contain the unfortunate and disastrous terrorist activities.
Assumptions
I. It is impossible to put on end to terrorist activities.
II. Efforts to control the terrorist activities are on.
(a) Only I
(b) Only II
(c) Either I or II
(d) Neither I nor II

64. A statement with two conclusions are given followed by four alternatives. Select the one alternative which is the most appropriate.
Statement No country is absolutely self-dependent these days.
Conclusions
I. It is impossible to grow and produce all that a country needs.
II. Countrymen in general have become lazy.
(a) Only I (b) Only II
(c) Either I or II (d) Neither I nor II

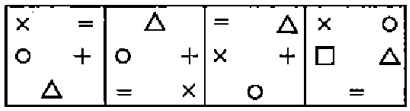
Direction (Q. Nos. 65-68) *Select the odd figure from the given responses.*

65.



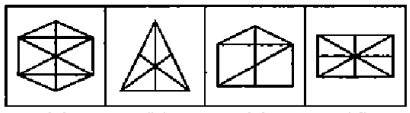
(a) (b) (c) (d)

66.



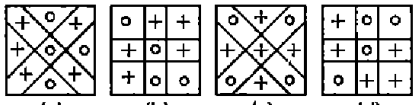
(a) (b) (c) (d)

67.



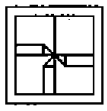
(a) (b) (c) (d)

68.

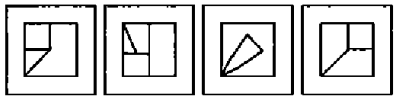


(a) (b) (c) (d)

69. Question Figure

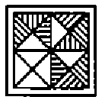


Answer Figures

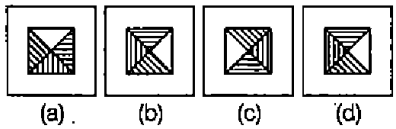


(a) (b) (c) (d)

70. Question Figure

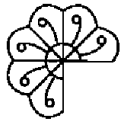


Answer Figures

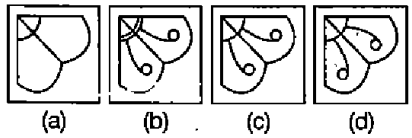


(a) (b) (c) (d)

71. Question Figure



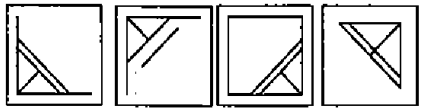
Answer Figures



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

72. Question Figure

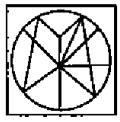
Answer Figures



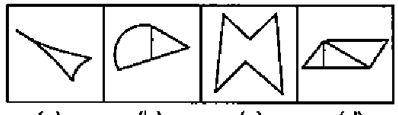
(a) (b) (c) (d)

73. Which of the answer figures is embedded in the question figure?

Question Figure



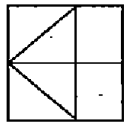
Answer Figures



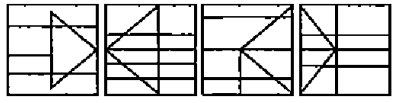
(a) (b) (c) (d)

74. From the given answer figures, select the one in which the question figure is hidden/ embedded.

Question Figure



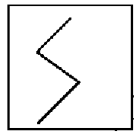
Answer Figures



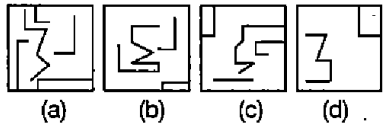
(a) (b) (c) (d)

75. From the given answer figures, select the one in which the question figure is hidden/ embedded.

Question Figure



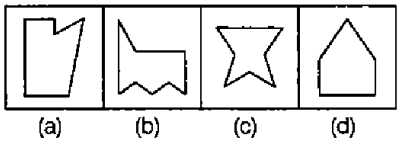
Answer Figures



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

76. Question Figure

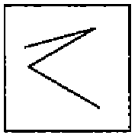
Answer Figures



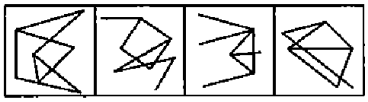
(a) (b) (c) (d)

77. From the given answer figures, select the one in which the question figure is hidden/ embedded.

Question Figure



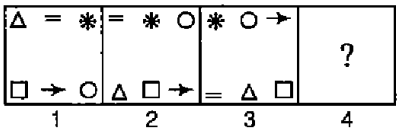
Answer Figures



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

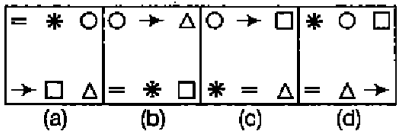
Directions (Q.Nos. 78-79) *In each of the following questions, which answer figure will come next in the series of question figures.*

78. Question Figures



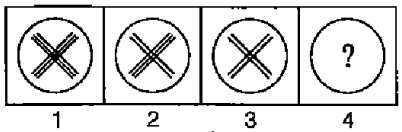
1 2 3 4

Answer Figures



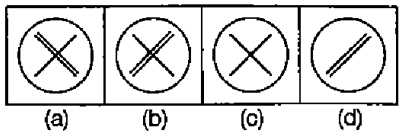
(a) (b) (c) (d)

79. Question Figures



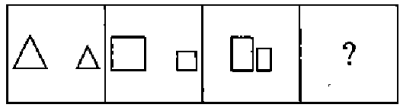
1 2 3 4

Answer Figures



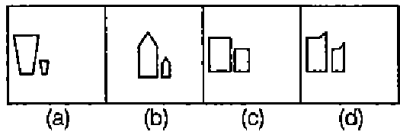
(a) (b) (c) (d)

80. Question Figures



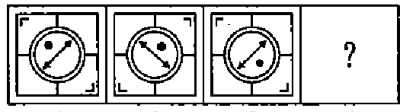
1 2 3 4

Answer Figures



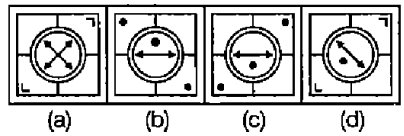
(a) (b) (c) (d)

81. Question Figures



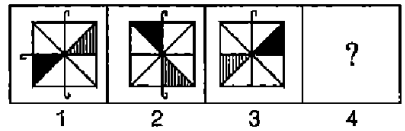
1 2 3 4

Answer Figures



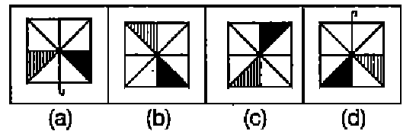
(a) (b) (c) (d)

82. Question Figures



1 2 3 4

Answer Figures



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

83. Out of the given responses, one of the factors of $x^3 - 3x^2 + 3x + 7$ is

(a) $x^2 - 4x + 7$

(b) $x^2 + 4x + 7$

(c) $x^2 + 4x - 7$

(d) $x^2 - 4x - 7$

84. If n is even, $(6^n - 1)$ is divisible by

(a) 37 (b) 35

(c) 30 (d) 6

85. Ramesh bought 10 cycles for ₹ 500 each. He spent ₹ 2000 on the repair of all cycles. He sold five of them for ₹ 750 each and the remaining for ₹ 550 each. Then, the total gain or loss% is

(a) Gain of $8\frac{1}{3}\%$ (b) Loss of $8\frac{1}{3}\%$

(c) Gain of $7\frac{2}{3}\%$ (d) Loss of $7\frac{1}{7}\%$

86. Two trains of equal length are running on parallel lines in the same direction at 46 km/h and 36 km/h. The faster train passes, the slower train in 36 s. The length of each train is
(a) 82 m (b) 50 m
(c) 80 m (d) 72 m

87. Two trains start from a certain place on two parallel tracks in the same direction. The speed of the trains are 45 km/h and 40 km/h, respectively. The distance between the two trains after 45 min will be
(a) 2 km 500 m (b) 2 km 750 m
(c) 3 km 750 m (d) 3 km 250 m

88. A, B and C can complete a work in 2 h. If A does the job alone in 6 h and B in 5 h, how long will it take for C to finish the job alone?
(a) $5\frac{1}{2}$ h (b) $7\frac{1}{2}$ h
(c) 9 h (d) $4\frac{1}{2}$ h

89. ₹6000 becomes ₹7200 in 4 yr at a certain rate of simple interest. If the rate becomes 1.5 times of itself, the amount of the same principal in 5 yr will be
(a) ₹8000 (b) ₹8250
(c) ₹9250 (d) ₹9000

90. A can do a work in 20 days and B in 40 days. If they work on it together for 5 days. Then, the fraction of the work that left is
(a) $\frac{5}{8}$ (b) $\frac{8}{15}$
(c) $\frac{7}{15}$ (d) $\frac{1}{10}$

91. A car driver leaves Bengaluru at 8 : 30 am and expects to reach a place 300 km from Bengaluru at 12 : 30 pm at 10 : 30 he finds that he has covered only 40% of the distance. By how much he has to increase the speed of the car in order to keep up his schedule?
(a) 45 km/h (b) 40 km/h
(c) 35 km/h (d) 30 km/h

92. The average monthly expenditure of a family for the first four months is ₹2570, for the next three months is ₹2490 and for the last five months is ₹3030. If the family saves ₹5320 during the whole year, then the average monthly income of the family during the year is
(a) ₹3000 (b) ₹3185
(c) ₹3200 (d) ₹3580

93. The sum of two numbers is 24 and their product is 143. The sum of their squares is
(a) 296 (b) 295
(c) 290 (d) 228

94. $\sqrt[3]{\sqrt{0.000064}}$ is equal to
(a) 0.0002 (b) 0.002
(c) 0.02 (d) 0.2

95. A box filled with paper bundles weighs 36 kg. If the weight of the box and paper bundles respectively are in the ratio of 3 : 22, then the weight of the papers (in g) is
(a) 30680 (b) 30710
(c) 31500 (d) 31680

96. The LCM of two numbers is 520 and their HCF is 4. If one of the numbers is 52, then the other number is
(a) 40 (b) 42
(c) 50 (d) 52

97. Weight of a bucket when filled fully with water is 17 kg. If the weight of the bucket when half filled with water is 13.5 kg, what is the weight of empty bucket?
(a) 12 kg (b) 8 kg
(c) 10 kg (d) 7 kg

98. In a fixed time, a boy swims double the distance along the current that he swims against the current. If the speed of the current is 3 km/h, then find the rate of swimming in still water
(a) 6 km/h (b) 9 km/h
(c) 10 km/h (d) 12 km/h

99. A boat goes 40 km upstream in 8 h and 36 km downstream in 6 h. The speed of the boat in still water is
(a) 6.5 km/h (b) 5.5 km/h
(c) 6 km/h (d) 5 km/h

100. If $a^2 + b^2 + 2b + 4a + 5 = 0$, then the value of $\frac{a-b}{a+b}$ is
(a) 3 (b) -3
(c) $\frac{1}{3}$ (d) $-\frac{1}{3}$

Answers

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

Hints *and* Solutions

1. paradox, yearning

2. repugnant, condoned

3. essence, unhampered

4. extenuating, compliance

5. 'Laying' should be replaced by 'lying'.
e.g., The tiger was lying down on the ground.

6. Remove 'much', which is superfluous usage here.
e.g., He is too weak to walk.

7. Replace 'in' by 'at' to make the syntax correct.
e.g., The robbers are active at midnight.

8. The correct grammatical structure should be 'does nature operate'.
e.g., Rarely, if ever does the captain make a statement about the poor performance of the team.

9. 'Leapt on' is wrong usage. 'Leapt' is followed by 'at'.
e.g., The panther leaped at the old man.

14. Suggestion made in trance.

15. Taking it seriously.

16. Make life easier.

17. *Barren* (Adjective) is used for unproductive land.
Synonyms Arid, fallow, desolate
Antonyms Damp, wet, fertile
e.g., The *barren* field becomes the playground for children.

18. *Infamy* (Noun) means famous for wrong things.
Synonyms Notorious, scandal, stigma
Antonyms Credit, pride, respect
e.g., Robbers are of *infamy* class.

19. *Intrepid* (Adjective) means courageous and fearless.
Synonyms Bold, daring, gutsy
Antonyms Afraid, meek, timid
e.g., Indian soldiers are intrepid fellows.

20. *Compassionate* (Adjective) means 'showing sympathy towards weak', so heartless is correct antonym which means 'avail'.
Antonyms Cruel, mean, harsh
Synonyms Tender, lenient, merciful
e.g., She is a *compassionate* lady and she helps everyone.

21. *Tasty* (Adjective) means 'having pleasant flavour', so insipid is correct antonym which means 'flavourless' or 'tasteless'.
Antonyms Dull, offensive, bland
Synonyms Delish, flavoury, divine
e.g., Mohan tea corner is famous for *tasty* foods and beverages.

22. *Triumph* (Noun) means 'a great achievement', so defeat is correct antonym which means 'failure' or 'tube unsuccessful'.
Antonyms Sadness, sorrow, forfeit
Synonyms Elation, pride, exultation
e.g., They celebrated their *triumph* with a great enthusiasm.

23. empty

24. quiet

25. temper

51. Except Equator all are zodiac signs.

52. Cataract is a disease, which effects on eye. Similarly, Pneumonia is a disease which effects on Lungs.

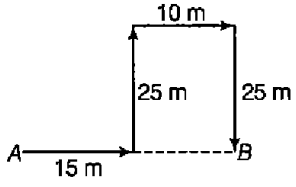
53. In the given pair, 7 is the backward position of T. Similarly, 9 is the backward position of R. Thus, the missing term will be

R R R
↓ ↓ ↓
9 9 9

54. As, NUS $\xrightarrow{\text{Reverse}}$ SUN rises in
YAD $\xrightarrow{\text{Reverse}}$ DAY.
Similarly, NOOM $\xrightarrow{\text{Reverse}}$ MOON shines in THGIN $\xrightarrow{\text{Reverse}}$ NIGHT.

55. As, $7 \times 3 + 3 = 21 + 3 \Rightarrow 24$
Same as, $23 \times 3 + 3 = 69 + 3 \Rightarrow 72$
Hence, 23 : 72 will be came in place of question mark.

56.



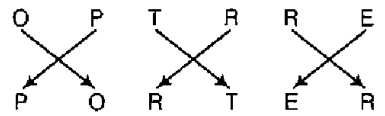
$AB = 15 + 10 = 25$ m

57.

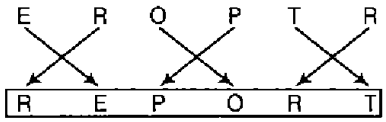
Letter	T	W	E	N	Y	L	V
Code	8	6	3	9	5	2	0

The code for TWELVE is 863203.

58. 25th August is a Thursday.
So, 22nd August is a Monday.
So, Mondays fall on 1st, 8th, 15th, 22th and 29th of August.
Thus, there are five Mondays.

59. 

Similarly,



So, the coded word will be read as REPORT.

60. Since, on premise is negative, the conclusion must be negative. Conclusion II cannot follow as it contains the middle term. So, only I follows.

61. The series is abadna/abadna/abadna/ab. Thus, the pattern 'abadna' is repeated.

62. The digits that cannot be opposite to 1 are 4 and 5. The possible numbers opposite to 1 are 2, 3 and 6, which comes in alternative first will be the answer.

63. The statement expresses concern over the issue as to when our country would be able to curb terrorism completely. The means that efforts are on and it is quite possible to put an end to terrorist activities although it could take longer. So, only II is implicit.

64. Clearly, only Conclusion I provides a suitable explanation to the given statement. So, only it follows the statement.

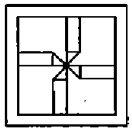
65. Except in figure (b), in all other figures, there are three similar designs.

66. Except in figure (d), in all other figures, all the three designs are similar. In figure (d), symbol'+' is replaced by '□'.

67. Except in figure (c), in other figures, line segments divide the shape into equal parts.

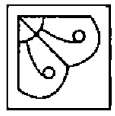
68. Except in figure (c), in all other figures two crosses and two circle are given together. In figure (c), cross and circle are placed alternately.

69. Answer figure (a) will complete the given pattern as shown below

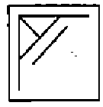


70. The white and the shaded patterns in the inner square alternate. The portion of the outer square, barring the inner square is shaded with line pattern parallel to the corresponding side of the inner square.

71. Clearly, option (c) figure will complete the pattern of the figure.



72. Clearly, option (b) figure will complete the pattern of the figure.



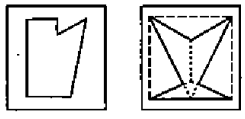
73. The question figure, is hidden in answer figure (c).

It is embedded in the question figure.

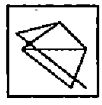
74. The question figure is embedded in answer figure (b) as shown below.

75. The question figure, is hidden in answer figure (a).

76. Clearly, the answer figure (c) is embedded after inverting in question figure as shown below



77. From answer figure, it is clear that question figure is hidden in the answer figure (d).



78. In each subsequent figure all the designs move in anti-clockwise direction. So, answer figure (c) will follow the pattern of given question figures..

79. Clearly, in question figures, two similar designs of varying size are given. The number of lines in the design decreases gradually. So, option (b) figure will follow the given pattern.

80. From question figures, we see that in each block the two figures are similiar to each other but different in size. Also, the number of sides increases in every block. In figures (1) and (2), both are placed at the ends of the block, but figure (3) is situated at the middle of the block. So, option (b) will be correct.

81. Clearly, in questions figures (1) to (2) the entire design is rotated through 90° in clockwise direction.
So, option (d) will follow the pattern of question figures.

82. From figures 1 to 2 one curve is deleted and the shaded parts of square move two sectors in clockwise direction. So, option (b) will replace symbol '?'.

83. Given expression,

$$f(x) = x^3 - 3x^2 + 3x + 7$$

By Hit and Trial

Put $x = -1$

$$f(-1) = (-1)^3 - 3(-1)^2 + 3(-1) + 7$$
$$= -1 - 3 - 3 + 7 = 0$$

$\therefore x = -1$ is the factor or $(x + 1)$ is the factor of the expression.

Now, dividing expression by $(x + 1)$.

$$x+1)\,x^3 - 3x^2 + 3x + 7 (x^2 - 4x + 7$$
$$\underline{x^3 + x^2}$$
$$-4x^2 + 3x + 7$$
$$\underline{-4x^2 - 4x}$$
$$7x + 7$$
$$\underline{7x + 7}$$
$$\times$$

$\therefore (x^2 - 4x + 7)$ is the factor of expression $x^3 - 3x^2 + 3x + 7$.

84. We have, $(6^n - 1)$.

If n is even, then taking $n = 2$,

$6^n - 1 = 6^2 - 1 = 36 - 1 = 35$

Here, number 35 is divisible by 35.

Hence, for any even value of n, $(6^n - 1)$ is divisible by 35.

85. Given, cost price of 1 cycle = 500

$\therefore$ Cost price of 10 cycles = 500 × 10
= 5000

But Ramesh spent ₹ 2000 on the repair

$\therefore$ Entire cost price = 5000 + 2000 = 7000

Now, (for 5 cycles)

Selling price of 1 cycle = 750

$\therefore$ Selling price of 5 cycles = 750 × 5
= 3750

and (for remaining 5 cycles)

Selling price of 1 cycle = 550

$\therefore$ Selling price of 5 cycles = 550 × 5
= 2750

So, entire selling price = 3750 + 2750
= 6500

Loss = Cost price − Selling price
= 7000 − 6500 = 500

86. Let the length of each train be x m.

Total length = $x + x = 2x$

Relative speed = 46 − 36 = 10 km/h

$$= \frac{10 \times 5}{18} \text{ m/s}$$
$$= \frac{25}{9} \text{ m/s}$$

$$\text{Time taken} = \frac{\text{Sum of length of train}}{\text{Relative speed of train}}$$

$$\therefore \quad \frac{2x}{\frac{25}{9}} = 36$$

$$\Rightarrow \quad 2x = \frac{36 \times 25}{9}$$

$$\Rightarrow \quad x = \frac{36 \times 25}{18}$$

$$\therefore \quad x = 50 \text{ m}$$

87. According to the question,

Relative speed = 45 − 40 = 5 km/h

$\therefore$ Required distance between two trains.

Distance = Speed × Time

$$= \left(5 \times \frac{45}{60}\right) \text{km}$$
$$= \frac{15}{4} \text{ km}$$
$$= 3 \text{ km } 750 \text{ m}$$

88. Let C alone can finish the job in x h.

According to the question,

Work done by A, B and C in 1 h $= \frac{1}{2}$

$$\Rightarrow \quad \frac{1}{6} + \frac{1}{5} + \frac{1}{x} = \frac{1}{2}$$

$$\Rightarrow \quad \frac{1}{x} = \frac{1}{2} - \frac{1}{6} - \frac{1}{5}$$
$$= \frac{15 - 5 - 6}{30}$$
$$= \frac{4}{30}$$
$$= \frac{2}{15}$$

$$\Rightarrow \quad x = 7\frac{1}{2} \text{ h.}$$

89. SI = Amount–Principal

$= ₹ (7200 - 6000) = ₹ 1200$

$\therefore \quad SI = \frac{P \times R \times T}{100}$

$\Rightarrow 1200 = \frac{6000 \times R \times 4}{100}$

$\Rightarrow \quad R = \frac{1200 \times 100}{6000 \times 4} = 5\%$

New rate of $R = 5 \times 1.5 = 7.5\%$

Then, $SI = \frac{6000 \times 7.5 \times 5}{100} = ₹ 2250$

$\therefore$ Amount $= ₹ (6000 + 2250) = ₹ 8250$

90. Time taken by $A = 20$ days and time taken by $B = 40$ days.

Then, $(A + B)$'s 5 days work

$$= 5\left(\frac{1}{20} + \frac{1}{40}\right)$$

$$= 5\left(\frac{2+1}{40}\right)$$

$$= \frac{15}{40} = \frac{3}{8}$$

$\therefore$ Remaining work $= 1 - \frac{3}{8} = \frac{5}{8}$

Fraction = 5 : 8.

91 According to the question,

Distance covered by car in 2 h i.e. from 8.30 am to 10.30 am = 40% of 300

$$= \frac{40 \times 300}{100} = 120 \text{ km}$$

Average speed of driver for first two hours

$$= \frac{120}{2} = 60 \text{ km/h}$$

Now, he has to cover the remaining distance *i.e.*, (300 − 120) 180 km in 2 h to reach at time.

$\therefore$ Average speed for next two hours

$$= \frac{180}{2} = 90 \text{ km/h}$$

$\therefore$ He has to increase the speed by

$(90 - 60) = 30$ km/h

92. Total earning of the family

$= 4 \times 2570 + 3 \times 2490 + 5 \times 3030 + 5320$

$= 10280 + 7470 + 15150 + 5320$

$= 38220$

$\therefore$ Average monthly income $= \frac{38220}{12}$

$= ₹ 3185$

93. Let the numbers be x and y.

$\therefore \quad x + y = 24$ and $xy = 143$

From formula

$\therefore \quad x^2 + y^2 = (x+y)^2 - 2xy$

$= (24)^2 - 2 \times 143$

$= 576 - 286 = 290$

94. Expression $= \sqrt[3]{\sqrt{0.000064}}$

$$= \sqrt[3]{\sqrt{\frac{64}{10^6}}} = \sqrt[3]{\frac{8}{10^3}}$$

$$= \sqrt[3]{\frac{2 \times 2 \times 2}{10 \times 10 \times 10}}$$

$$= \frac{2}{10} = 0.2$$

95. Given, total weight = 36 kg and

Ratio of weight of box and paper bundles $= 3 : 22$

or weight of the box $= 3x$ g

and weight of the bundle $= 22x$ g

$\Rightarrow \quad 3x + 22x = 36 \times 1000$ g

$\Rightarrow \quad 25x = 36000$ g

$\Rightarrow \quad x = \frac{36000}{25} = 1440$ g

$\therefore$ Weight of the paper $= 22x$

$= 22 \times 1440$

$= 31680$ g

96. HCF × LCM = Product of two numbers.

$\therefore \quad 4 \times 520 = 52 \times$ Second number

$\therefore$ Second number $= \frac{4 \times 520}{52} = 40$

97. Total weight of bucket, fully filled by water

$= 17$ kg

Now, weight of bucket, half filled by water

$= 13.5$ kg

$\therefore$ Weight of water when bucket is half filled

$= (17 - 13.5)$ kg $= 3.5$ kg

$\therefore$ Weight of water when bucket is fully filled

$= 2 \times 3.5$ kg $= 7$ kg

Now, Weight of empty bucket

$= (17 - 7)$ kg $= 10$ kg

98. Let the rate of swimming in still water be x km/h.

$\therefore$ Speed downstream = $(x+3)$ km/h

$\therefore$ Speed upstream = $(x-3)$ km/h

According to the question,

$(x+3)\,t = 2\,(x-3) \times t \Rightarrow x+3 = 2x-6$

$\therefore \quad x = 9$ km/h

99. Speed upstream $= \frac{40}{8} = 5$ km/h

Speed downstream $= \frac{36}{6} = 6$ km/h

$\therefore$ Speed of boat in still water $= \frac{1}{2}$

(speed upstream + speed downstream)

$= \frac{1}{2}(5+6) = 5.5$ km / h

100. Given, $a^2 + b^2 + 2b + 4a + 5 = 0$

$\Rightarrow \quad a^2 + 4a + b^2 + 2b + 5 = 0$

$\Rightarrow \quad a^2 + 4a + 4 + b^2 + 2b + 1 = 0$

$\Rightarrow \quad (a+2)^2 + (b+1)^2 = 0$

$[\because (a+b)^2 = a^2 + b^2 + 2ab]$

It is possible only, when

$a + 2 = 0$

$\Rightarrow \quad a = -2$

and $\quad b + 1 = 0$

$\Rightarrow \quad b = -1$

$\therefore \quad \frac{a-b}{a+b} = \frac{-2+1}{-2-1}$

$= \frac{-1}{-3} = \frac{1}{3}$