

Section 1: Maths and DI - 1 hour 10 minutes time

Total time 2 hrs 20 mins

Q1-2: In a game played by two people there were initially N match sticks kept on the table. A move in the game consists of a player removing either one or two matchsticks from the table. The one who takes the last matchstick loses. Players make moves alternately. The player who will make the first move is A. The other player is B.

1. The smallest value of N (greater than 5) that ensures a win for B is

- (a) 7
- (b) 6
- (c) 10
- (d) 8

2. The largest of N (less than 50) that ensures a win for B is

- (a) 46
- (b) 47
- (c) 48
- (d) 49

3. There were x pigeons and y mynahs in a cage. One fine morning p of them escaped to freedom. If the bird keeper, knowing only that $p = 7$, was able to figure out without looking into the cage that at least one pigeon had escaped, then which of the following does not represent a possible (x, y) pair?

- (a) (10,8)
- (b) (7,2)
- (c) (25,6)
- (d) (12,4)

4. The remainder when 2^{60} is divided by 5 equals

- (a) 0
- (b) 1
- (c) 2
- (d).None of these

5. Mr.X enters a positive integer Y in an electronic calculator and then goes on pressing the square – root key repeatedly. Then

- (a) The display does not stabilize
- (b) The display becomes closer to 0
- (c) The display becomes closer to 1
- (d) May not be true and the answer depends on the choice of Y

6. What is the sum of the following series:
 $1/(1 \times 2) + 1/(2 \times 3) + 1/(3 \times 4) + \dots + 1/(100 \times 101)$

- (a) 99/100
- (b) 1/100
- (c) 100/101
- (d) 101/102

7. The value of

$$1/(1-x) + 1/(1+x) + 2/(1+x^2) + 4/(1-x^6)$$

- a) $8/(1-x^8)$
- b) $4x/(1+x^2)$
- c) $4/(1-x^6)$
- d) $4/(1+x^4)$

8. Let a, b be any positive integers and $x = 0$ or 1 , then

- a) $a^x n^{(1-x)} = xa + (1-x)b$
- b) $a^x n^{(1-x)} = xb + (1-x)a$
- c) $a^x b^{(1-x)} = a^{(1-x)} bx$
- d) None of the above is always true

9. There are six boxes numbered 1, 2, 3, 4, 5, 6. Each box is to be filled up either with a white ball or a black ball in such a manner that at least one box contains a black ball and all the boxes containing black balls are consecutively numbered. The total number of ways in which this can be done equals.

- (a) 15
- (b) 21
- (c) 63
- (d) 64

10. Consider the following steps :

1. Put $x = 1, y = 2$
2. Replace x by xy
3. Replace y by $y + 1$
4. If $y = 5$ then go to step 6 otherwise go to step 5.
5. Go to step 2
6. Stop

Then the final value of x equals

- (a) 1
- (b) 24
- (c) 120
- (d) 720

11. In a stockpile of products produced by three machines M_1, M_2 and M_3 , 40% and 30% were manufactured by M_1 and M_2 respectively. 3% of the products of M_1 are defective, 1% of products of M_2 defective, while 95% of the products of M_3 are not defective. What is the percentage of defective in the stockpile?

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- (a) 3%
- (b) 5%
- (c) 2.5%
- (d) 4%

12. From any two numbers x and y , we define $x * y = x + 0.5y - xy$. Suppose that both x and y are greater than 0.5.

Then $x * x < y * y$ if

- (a) $1 > x > y$
- (b) $x > 1 > y$
- (c) $1 > y > x$
- (d) $y > 1 > x$

13. Consider a function $f(k)$ defined for positive integers $k = 1, 2, \dots$; the function satisfies the condition

$f(1) + f(2) + \dots = p/(p-1)$. Where p is fraction i.e. $0 < p < 1$.

Then $f(k)$ is given by

- (a) $p(-p)^{k-1}$
- (b) $p(1-p)^{k-1}$
- (c) $\{p(1-p)\}^{k-1}$
- (d) None of these

14. 116 people participated in a singles tennis tournament of knock out format. The players are paired up in the first round, the winners of the first round are paired up in second round, and so on till the final is played between two players. If after any round, there is odd number of players, one player is given a bye, i.e. he skips that round and plays the next round with the winners. Find the total number of matches played in the tournament.

- (a) 115
- (b) 53
- (c) 232
- (d) 116

15. If n is any positive integer, then $n^3 - n$ is divisible

- (a) Always by 12
- (b) Never by 12
- (c) Always by 6
- (d) Never by 6

16. The value of $(1-d^3)/(1-d)$ is

- (a) > 1 if $d > -1$
- (b) > 3 if $d > 1$
- (c) > 2 if $0 < d < 0.5$
- (d) < 2 if $d < -2$

17. Gopal went to a fruit market with certain amount of money. With this money he can buy either 50 oranges or 40 mangoes. He retains 10% of the money for taxi fare. If he buys 20 mangoes, then the number of oranges he can buy is

- (a) 25
- (b) 18
- (c) 20
- (d) None of these

Questions 18-20 : A dealer deals only in colour TVs and VCRs. He wants to spend up to Rs.12 lakhs to buy 100 pieces. He can purchase a colour TV at Rs.10,000 and a VCR at Rs.15,000. He can sell a colour TV at Rs.12,000 and a VCR at Rs.17,500. His objective is to maximize profits. Assume that he can sell all the items that he stocks.

18. For the maximum profit, the number of colour TVs and VCRs that he should respectively stock are

- (a) 80, 20
- (b) 20, 80
- (c) 60, 40
- (d) None of these

19. If the dealer would have managed to get an additional space to stock 20 more items, then for maximizing profit, the ratio of number of VCRs and number of TVs that he should stock is

- (a) 7 : 3
- (b) 0
- (c) 1 : 2
- (d) None of these

20. The maximum profit, in rupees lakh, the dealer can earn from his original stock if he can sell a colour TV at Rs.

12200 and VCR at Rs.18300 is

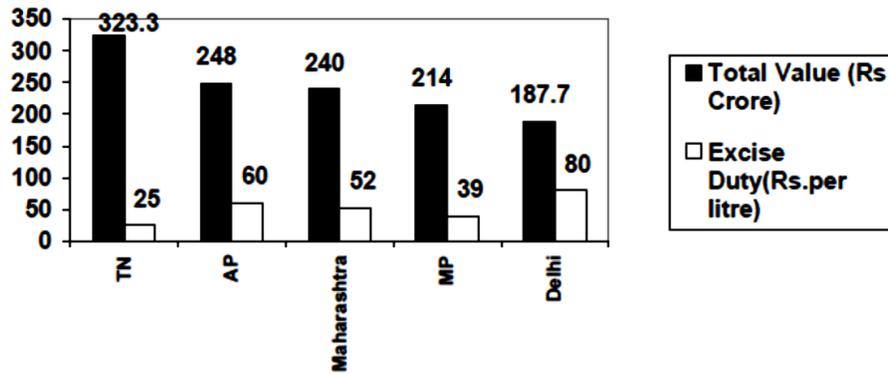
- (a) 2.64
- (b) 2.49
- (c) 2.72
- (d) 2.87

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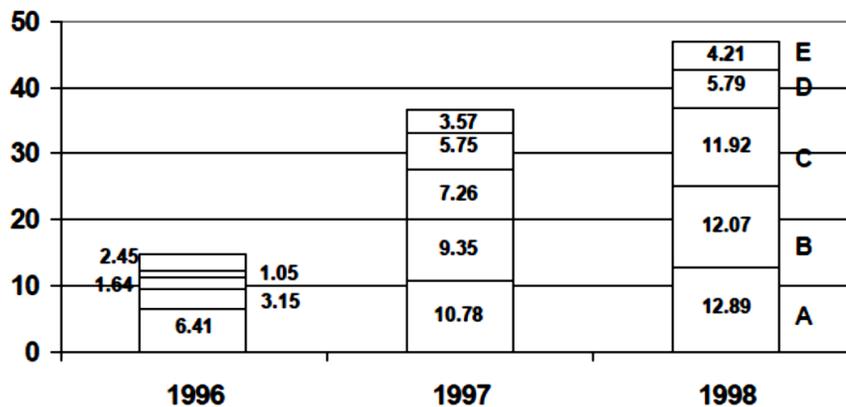


Questions 21 – 30 : In these questions, you are provided data in the form of charts and/or tables. Study the data carefully and answer the questions following them

Q21-24 : The following graph shows the value of liquor supplied by the 5 states in 1996 and the excise duty rates in each state.



Amount of liquor supplied in Tamil Nadu Distilleries A, B, C, D, E (from bottom to top) in lakh litres.



21. What is the lowest percentage difference in the excise duty rates for any two states?

- (a) 12
- (b) 15
- (c) 20
- (d) Cannot be determined.

22. Which of the five states manufactured liquor at the lowest cost?

- (a) Tamil Nadu
- (b) Delhi
- (c) The states which has the lowest value for (wholesale price-Excise duty) per litre
- (d) Cannot be determined.

23. If Excise duty is levied before the goods leave the factory (on the value of the liquor), then which of the following choices shows distilleries in ascending order of the excise duty paid by them for the year 1996? (Assume the total liquor in TN is supplied by only these 5 distilleries).

- (a) ECABD
- (b) ADEBC

- (c) DCEBA
- (d) Cannot be determined.

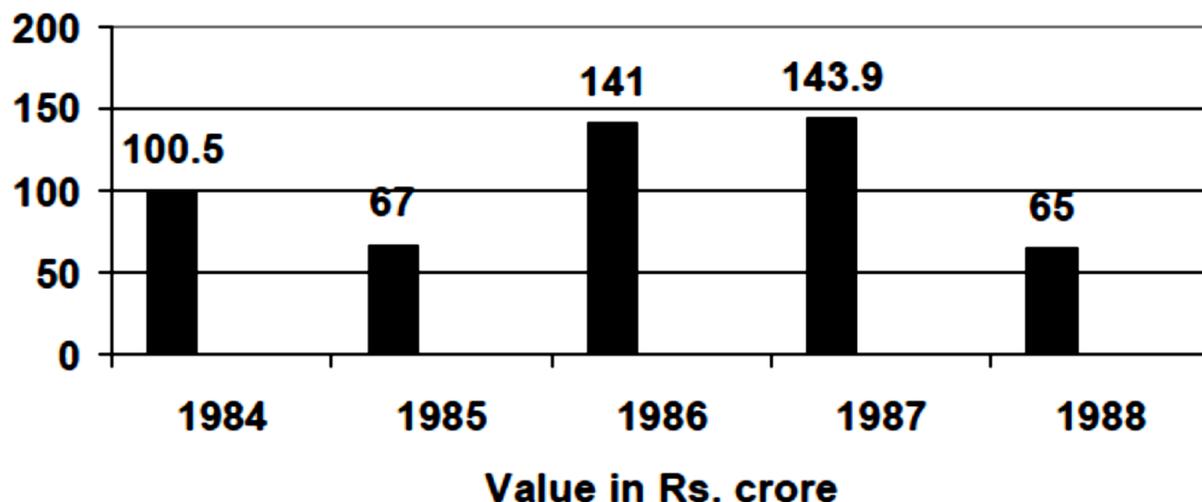
24. If the Tamil Nadu distillery, with the least average simple annual growth in amount of liquor supplied in the given period had shown the same rate of growth as the one which grew fastest, what would that company's supply have been

in 1998, in lakh liters?

- (a) 13
- (b) 15.11
- (c) 130
- (d) Cannot be determined

Questions 25 to 27 : Refer to the following Bar-chart and answer the questions that follow :

Project Exports: Contracts Secured



25. What is the average value of the contract secured during the years shown in the diagram?

- (a).Rs. 103.48 crore
- (b).Rs. 105 crore
- (c) Rs. 100 crore
- (d).Rs.125.2 crore

26. Compared to the performance in 1985 (i.e. taking it as the base), what can you say about the performances in the years '84, '85, '86, '87, '88 respectively, in percentage terms?

- (a) 150, 100, 211, 216, 97
- (b) 100, 67, 141,144,65
- (c) 150, 100, 200, 215, 100
- (d) 120, 100, 220, 230, 68

27. Which is the year in which the highest percentage decline is seen in the value of contract secured compared to the preceding year?

- (a) 1985
- (b) 1988

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- (c) 1984
(d) 1986

Questions 28 to 30 : The table below gives the achievements of Agricultural Development Programmes from 1983 – 84 to 1988– 89. Study the following table and for each of the following questions, choose the best alternative.

Programme	83 – 84	84 - 85	85 - 86	86 - 87	87 - 88	88 – 89
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Irrigation (Cumulative in Million Hectares)

Major & Medium	22.05	22.70	23.20	24.00	24.60	25.32
Minor	28.60	32.77	32.77	34.20	34.00	35.14

High yielding varieties (Million Hectares)

1. Paddy	16.90	18.20	19.70	18.70	21.70	22.80
2. Wheat	15.90	16.10	16.80	17.80	19.40	19.10
3. Jowar	3.10	3.50	3.90	4.40	5.30	5.10
4. Bajra	2.90	3.60	4.60	4.70	5.40	5.20
5. Maize	1.40	1.60	1.60	1.70	1.90	2.00

Consumption of Chemical fertilizers (Million tons)

1. Nitrogen	3.42	3.68	4.07	4.22	5.20	5.49
2. Phosphate	1.11	1.21	1.32	1.44	1.73	1.89
3. Potash	0.59	0.62	0.67	0.73	0.78	0.84

Gross Cropped area (Million hectares)

	174.8	173.1	177.00	172.6	180.4	187.8
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28. The consumption of chemical fertilizer per hectare of gross cropped area is lowest for the year
 (a) 1984 – 85
 (b) 1985 – 86
 (c) 1986 – 87
 (d) 1987 – 88
29. In which year does the area cropped under high yielding varieties show a decline for the maximum number of crops?
 (a) 1988 – 89
 (b) 1985 – 86
 (c) 1986 – 87
 (d) None of these
30. How much area, in million hectares, was brought under irrigation during the year 1986-87?
 (a) 58.20
 (b) 1.43
 (c) 0.80
 (d) 2.23

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Section 2 – Verbal & Logic - 1 hour 10 minutes time

Passage I

The motive force that has carried the psychoanalytic movement to a voluminous wave of popular attention and created for it considerable following those discontent with traditional methods and attitudes, is the frank direction of the psychological instruments of exploration to the insistent and intimate problems of human relations. However false or however true its conclusions, however weak or strong its arguments, however effective or defective or even pernicious its practice, its mission is broadly humanistic. Psychological enlightenment is presented as a program of salvation. By no other appeal could the service of psychology have become so glorified. The therapeutic promise of psychoanalysis came as the most novel, most ambitious, most releasing of the long procession of curative systems that mark the history of mental healing.

To the contemporary trends in psychology psychoanalysis actually offered a rebuke, a challenge, a supplement, though it appeared to ignore them. With the practical purpose of applied psychology directed to human efficiency it had no direct relation and thus no quarrel. The solution of behaviorism, likewise bidding for popular approval by reducing adjustment to a program of conditioning, it inevitably found alien and irrelevant, as the behaviorist in reciprocity found psychoanalytic doctrine mystical, fantastic, assumptive, remote. Even to the cognate formulations of mental hygiene, as likewise in its contacts with related fields of psychology, psychoanalysis made no conciliatory advances. Towards psychiatry, its nearest of kin, it took an unfriendly position, quite too plainly implying a disdain for an unprogressive relative. These estrangements affected its relations throughout the domain of mind and its ills; but they came to head in the practice.

From the outset in the days of struggle, when it had but a sparse and scattered discipleship, to the present position of prominence, Freudianism went its own way, for the most part neglected by academic psychology. Of dreams, lapses and neuroses, orthodox psychology had little say. The second reason for the impression made by psychoanalysis when once launched against the tide of academic resistance was its recognition of depth psychology, so much closer to human motivation, so much more intimate and direct than the analysis of mental factors.

Most persons in trouble would be grateful for relief without critical examination of the theory behind the practice that helped them. Anyone at all acquainted with the ebb and flow of cures – cures that cure cures that fail – need not be told that the scientific basis of the system is often the least important factor. Many of these systems arise empirically within a practice, which by trial, seems to give results. This is not the case in psychoanalysis. Psychoanalysis belongs to the typical groups of therapies in which practice is entirely a derivative of theory. Here the pertinent psychological principle reads: “Create a belief in the theory, and the fact will create themselves”.

31. The distinctive feature of psychoanalysis is that

- (a) it provided the laymen with a scientific basis to the theories of psychology.
- (b) it blasted the popular theory that the conscious mind could be aptly linked the tip of an iceberg.
- (c) it provided effective means for the cure of mental disorders.
- (d) it rendered existing trends in psychology defunct.

32. The distinction between behaviorism and psychoanalysis that is heightened here is which of the following?

- (a) Behaviorism is wide in scope; psychoanalysis more restricted.
- (b) Behaviorism are more tolerant in their outlook; psychoanalysis more dogmatic.
- (c) Behaviorism traces all action to conditioning by habit; psychoanalysis to the depths of the human mind.
- (d) Behaviorism are more circumspect and deliberate in their propagation of theory; psychoanalysis jump to conclusion impetuously.

33. The statement which is refuted by the passage is this:

- (a) The popularity enjoyed by psychoanalysis is partly due to the disenchantment with traditional methods of psychology.
- (b) Psychoanalysis wooed people dissatisfied with other branches of psychology to swell their ranks.

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- (c) Psychoanalysis were pioneers in the realm of analysis of the subconscious mind.
- (d) Psychoanalysis alienated allied branches of psychology.

34. Create a belief in theory and

- (a) belief will be created itself.
- (b) theory will be created itself.
- (c) facts will be created themselves .
- (d) All of the above.

35. Psychoanalysis are of the opinion that

- (a) methods of psychoanalysis must be in keeping with individual needs.
- (b) inferences can be drawn empirically from repeated experiments with any given theory.
- (c) theory leads to practice.
- (d) practice culminates into theory.

36. Freudian psychoanalysis was ignored by academic psychology because of which of the following?

- (a) Its theories were not substantiated by practical evidence.
- (b) It probed too deep into the human mind thereby divesting it of its legitimate privacy.
- (c) It did not have a large following.
- (d) It was pre-occupied with unfamiliar concepts such as dreams and the subconscious mind.

37. The only statement to receive support from the passage is which of the following?

- (a) Psychoanalysis concentrated more on the theoretical remedies than their practical implementation.
- (b) Psychoanalysis broke the shackles of convention in its involvement with humanistic issues.
- (c) The attitude of psychoanalysis towards allied branches of psychology could at best be described as indifferent.
- (d) Psychoanalysis dispelled the prevalent notion that dreams were repressed desires.

38. The popularity enjoyed by the psychoanalytical movement may be directly attributed to

- (a) dissatisfaction with existing methods of psychology.
- (b) its logical, coherent process of ratiocination.
- (c) its novel unconventionality in both postulate and practice.
- (d) its concentration upon the humanistic aspect of psychological analysis.

Passage 2

It is undeniable that some very useful analogies can be drawn between the relational systems of computer mechanism and the relational systems of brain mechanism. The comparison does not depend upon any close resemblance between the actual mechanical links which occur in brains and computers; it depends on what the machines do. Further more, brains and computers can both be organized so as to solve problems. The mode of communication is very similar in both the cases, so much so that computers can now be designed to generate artificial human speech and even, by accident, to produce sequences of words which human beings recognize as poetry. The implication is not that machines are gradually assuming human forms, but that there is no sharp break of continuity between what is human, what is mechanical.

39. From the passage, it is evident that the author thinks

- (a) computers are now naturally programmed to produce poetry.
- (b) computers are likely to usurp the place of intellectual superiority accorded to the human brain.
- (c) the resemblance that the computer bears to the human brain is purely mechanical.
- (d) the unintentional mixing up of word sequences in the computer can result in poetry.

40. Computers have acquired a proven ability of performing many of the functions of the human brain because

- (a) the brain of modern man is unable to discharge its functions properly on account of over-reliance on machines.
- (b) the sophisticated computer mechanism is on the verge of outstripping human mental faculties.
- (c) the process of organizing and communicating are similar in both cases.

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(d) the mechanics of the human brain have been introduced in the computer.

41. The resemblance between the human brain and the computer is

- (a) imaginary.
- (b) intellectual.
- (c) mechanical.
- (d) functional.

42. The passage implies that

- (a) computers are assuming human forms.
- (b) human are assuming mechanical forms.
- (c) computers and humans are substitutable.
- (d) there is continuity between what is human and what is mechanical.

43. The author uses the word 'recognize' in relation to computer poetry to convey a

- (a) sense of sorrow at the reluctant admission of the superiority of machines by mankind.
- (b) feeling that computers have yet to conquer the emotional heights that man is capable of attaining.
- (c) feeling of derision for the popular faith in the omnipotence of the computer.
- (d) feeling of a fatalistic acceptance of the computer's encroachment upon human bastions.

44. Points of dissimilarity between the human brain and the computer don't extend to

- (a) the faculty of composing poetry.
- (b) methods of communication.
- (c) the faculty of composing poetry.
- (d) the faculty of speaking naturally

Questions 45 to 49: Each pair of CAPITALIZED words given below is followed by four pairs of words. Choose the pair which does not exhibit the relationship similar to that expressed in the capitalized pair.

45. RENT : LEASE

- (a) interest : borrow
- (b) salary : employ
- (c) price : buy
- (d) tax : govern

46. TEMPERATURE : HEAT

- (a) votes : popularity
- (b) IQ : intelligence
- (c) ohms : resistance
- (d) speed : distance

47. PROGRESS : PROGRESSIVE

(a) terror : terrorist

- (b) sympathy : sympathizer
- (c) revolution : revolutionary
- (d) reform : reformist

48. STUBBORN : ADAPTABLE

- (a) stupid : bright
- (b) moral : amoral
- (c) inherent : extraneous
- (d) friend : enemy

49. CLIPS : PAPER

- (a) thread : beads
- (b) cement : bricks
- (c) ribbon : hair
- (d) bag : vegetables

Questions 50 to 55: In each of the questions below, there are four statements which express the same idea. Choose the alternative that is most concise and clear.

50.

- (a) The history of Modern Industry's performance, which is marginal at best, may be an indication of solvency problems that will occur in the future.
- (b) Modern industry's history of marginal performance may indicate solvency problems in the future.
- (c) The history of marginal performance of Modern Industry may indicate future solvency problems.
- (d) Modern Industry's history of performance, which is marginal at best, may indicate future solvency problems.

51.

- (a) On the whole food front one may say that we can enjoy festivals in the consciousness that though some things are dear, the basic foods are better in quality and still low in price.
- (b) We can enjoy festivals knowing that though some things are clear, the basic foods are of better quality and still low in price.
- (c) Although we know that some things are dear, we can still enjoy festivals because the basic foods are better in quality and low in price.

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(d) On the whole food front, although some things are dear, we can still enjoy festivals as the basic foods are of better quality and quite cheap.

52.

- (a) The dull are likely to have a limited conceptual grasp.
- (b) It is unlikely that the dull would have adequate conceptual grasp.
- (c) The dull are not likely to grasp concepts easily.
- (d) It is unlikely that the dull can grasp concepts easily.

53.

- (a) I request you to kindly deliver to me a tin of milk powder.
- (b) Could you please send me a tin of milk powder?
- (c) May I request you to please send me a tin of milk powder?
- (d) Can I have milk powder sent to me please?

54.

- (a) There is no question of it not being possible to freeze you to death and wake you up as and when you want.
- (b) There is no question of it not being possible to freeze you to death and wake you up whenever you want.
- (c) Undoubtedly, it should be possible to freeze you to death and wake you up whenever you want.
- (d) Undoubtedly, it should be possible to freeze you to death and wake you up when you want.

55.

- (a) Finally, there will be unexpected, unanticipated implicational consequences of this development concerning human life.
- (b) This development concerning human life will finally have unanticipated consequences.
- (c) This development concerning human life will finally have unexpected and unanticipated implications.
- (d) This development concerning human life will finally have unexpected implications.

Questions 56 to 60: Each of these questions contains six statements followed by four sets of combinations of three. Choose the set in which the statements are most logically related.

56.

- A. Some of my closest friends disapprove of me.
 - B. Some of my closest friends are aardvarks.
 - C. All of my closest friends disapprove of me.
 - D. All who disapprove of me are aardvarks.
 - E. Some who disapprove of me are aardvarks.
 - F. Some of my closest friends are no aardvarks.
- (a) BCD
 - (b) ABD
 - (c) BCE

(d) ABE

57.

- A. All those who achieve great ends are happy.
 - B. All young people are happy.
 - C. All young people achieve great ends.
 - D. No young people achieve great ends.
 - E. No young people are happy,
 - F. Some young people are happy.
- (a) ADE
 - (b) ABF
 - (c) ACB
 - (d) ADF

58.

- A. All candid men are persons who acknowledge merit in a rival.
 - B. Some learned men are very candid.
 - C. Some learned men are not persons who acknowledge merit in a rival.
 - D. Some learned men are persons who are very candid.
 - E. Some learned men are not candid.
 - F. Some persons who recognize merit in a rival are learned.
- (a) ABE
 - (b) ACF
 - (c) ADE
 - (d) BAF

59.

- A. All roses are fragrant.
 - B. All roses are majestic.
 - C. All roses are plants.
 - D. All roses need air.
 - E. All plants need air.
 - F. All plants need water.
- (a) CED
 - (b) ACB
 - (c) BDC
 - (d) CFE

60.

- A. All men are men of scientific ability.
 - B. Some women are women of scientific ability.
 - C. Some men are men of artistic genius.
 - D. Some men and women are of scientific ability.
 - E. All men of artistic genius are men of scientific ability.
 - F. Some women of artistic genius are women of scientific ability.
- (a) ACD
 - (b) ACE
 - (c) DEF
 - (d) ABC