PERMUTATION COMBINATION

Previous year question

Q1.
In how many different ways can letters of the word SOFTWARE be arranged in such a way that the vowels always come together?
(a)13440
(b)1440
(c)360
(d)120
(e) None of these

Q2.
In how many different ways a group of 4 men and 4 women be formed out of 1 men and 8 women ?
(a)2450
(b)105
(c)1170
(d)Cannot be determined
(e)None of these

Q3.
A team of 5 children is to be selected out of 4 girls and 5 boys such that it contains at least 2 girls. In how many different ways the selection can be made ?
(a)105
(b)60
(c)100
(d)120
(e) None of these.

Q4.
In how many different ways can the letters of the word 'PADDLED' be arranged ?
(a)910
(b)2520
(c)5040
(d)840
(e) None of these

Q5.
In how many different ways canthe letters of the. word 'BLOAT -ING' be arranged ?.
(a)40320
(b)5040
(c)2520
(d)20160
(e) None of these

Q6.
In how many different ways can the letters of the word 'CREATE' be arranged ?
(a)25
(b)36
(c)710
(d)360

(e) None of these

Q7.
In how many different ways can the letters of the word 'SMART be arranged ?
(a)25
(b)60
(c)180
(d)200
(e) None of these

Q8.
Out of 5 men and 3 women, a committee of 3 members is to be formed so that it has 1 woman and 2 men. In how many different ways can it be done ?
(a)20
(b)10
(c)23
(d)30
(e)None of these

Q9.
In how many different ways can the letters of the word DESIGN be arranged so that the vowels are at the two ends?
(a)48
(b)72
(c)36
(d)24
(e) None of these

Q10.
Out of 5 women and 4 men a committee of three members is to be formed in such away that at least one member is a woman. In how many different ways can it be done ?
(a)80
(b)84
(c)76
(d)96
(e) None of these

Q11.
In how many different ways can the letters of the word TOTAL be arranged ?
(a)120
(b)60
(c)48
(d)72
(e) None of these

Q12.
A school team has eight volleyball players. A five-member team will be selected out of these eight players. How many different selections can be made ?
(a)224
(b)112
(c)56
(d)88

(e) None of these

Q13.

In how many different ways can the letters of the word 'AWARE' be arranged?

(a)150

(b)120

(c)40

(d)60

(e) None of these

Q14.

In how many different ways can the letters of the word 'OFFIG-ES' be arranged ?

(a)2520

(b)5040

(c)1850

(d)1680

(e) None of these

Q15.

In how many different ways can the letters of the word TRUST be arranged ?

(a)60

(b)240

(c)120

(d)25

(e) None of these

Q16.

In how many different ways can the letters of the word ATTEND be arranged ?

(a)60

(b)120

(c)240

(d)80

(e) None of these

Q17.

In how many different ways can the letters of the word 'BANKING' be arranged ?

(a)5040

(b)2540

(c)5080

(d)2520

(e) None of these

Q18.

In how many different ways can the letters of the word 'PEANUT be arranged ?

(a)720

(b)360

(c)650

(d)700

(e) None of these

Q19.

Directions: Study the following information carefully to answer the questions that follow :A committee of five members is to be formed out of 4 students, 3 teachers and 2 sports coaches. In how many ways can the committee be formed if - the Committee should consist of 2 students, 2 teachers and 1 sports coach ?

(a)25

(b)64

(c)9

(d)36

(e) None of these

Q20.

Directions: Study the following information carefully to answer the questions that follow :A committee of five members is to be formed out of 4 students, 3 teachers and 2 sports coaches. In how many ways can the committee be formed if - any five people can be selected ?

(a)126

(b)45

(c)120

(d)24

(e) None of these

Q21.

In how many different ways can the letters of the word 'LEASE' be arranged?

(a)240

(b)120

(c)25

(d)60

(e) None of these

Q22.

In how many different ways can the letters of the word 'CYCLE' be arranged?

(a)120

(b)240

(c)30

(d)80

(e) None of these

Q23.

Directions : Study the given information carefully to answer the questions that follow.A committee of 6 teachers is to be formed out of 4 science teachers, 5 art teachers and 3 commerce teachers. In how many different ways can the committee be formed if - two teachers from each stream are to be included ?

(a)210

(b)180

(c)145

(d)96

(e) None of these

Q24.

Directions : Study the given information carefully to answer the questions that follow.A committee of 6 teachers is to be formed out of 4 science teachers, 5 art teachers and 3 commerce teachers. In how many

different ways can the committee be formed if - no teacher from the commerce stream Is to be included ?
(a)81
(b)62
(c)46
(d)84
(e) None of these

Q25.
Directions : Study the given information carefully to answer the questions that follow.A committee of 6 teachers is to be formed out of 4 science teachers, 5 art teachers and 3 commerce teachers. In how many different ways can the committee be formed if - any teacher can be included in the committee ?
(a)626
(b)718
(c)924
(d)844
(e) None of these

Q26.
In how many different ways can the letters of the word 'PRAISE' be arranged ?
(a)720
(b)610
(c)360
(d)210
(e) None of these

Q27.
In how many different ways canthe letters of the word ' THERAPY' be arranged so that the vowels never come together?
(a)720
(b)1440
(c)5040
(d)3600
(e)4800

Q28.
In how many ways the letters of the word VISITING can be rearranged ?
(a)6720
(b)5720
(c)720
(d)7620
(e) None of these

Q29.
In how many different ways can the letters of the word 'REPLACE' be arranged ?
(a)2630
(b)5040
(c)1680
(d)2580
(e) None of these

Q30.

In how many ways the letters of the word SACRED can be arranged so that vowels come together?
(a)240
(b)120
(c)320
(d)720
(e) None of these

Q31.
In how many different ways can the letters of the word RUMOUR be arranged ?
(a)180
(b)720
(c)30
(d)90
(e) None of these

Q32.
In how many different ways can the letters of the word 'CANDIDATE' be arranged in such a way that the vowels always come together?
(a)4320
(b)1440
(c)720
(d)840
(e)1560

Q33.
A committee of five members is to be formed out of 3 trainees, 4 professors and 6 research associates. In how many different ways this can be done if the committee should have all the 4 professors and 1 research associate or all 3 trainees and 2 professors?
(a)15
(b)18
(c)25
(d)12
(e) Other than those given as options

Q34.
Arrange the letters of word AUCTION in such a way that the vowels always occur together. Find the number of ways?
(a)576
(b)48
(c)144
(d)30
(e) None of these

Q35.
In a group of 6 boys and 4 girls 4 children are to be selected. In how many different ways can they be selected such that at least one boy should be there?
(a)159
(b)205
(c)194
(d)209
(e) None of these

Q36.

In how many different ways can the letters of the word JUDGE be arranged in such a way that the vowels always come together?

(a)48

(b)124

(c)120

(d)160

(e) None of these

Q37.

Two girls and 4 boys are to be seated in a row in such a way that the girls do not sit together. In how many different ways can it be done ?

(a)720

(b)480

(c)360

(d)240

(e) None of these

Q38.

In how many ways can a group of 5 men and 2 women be made out of total of 7 men and 3 women ?

(a)63

(b)45

(c)126

(d)90

(e) None of these

Q39.

In how many different ways can the letters of the Word CORPORATION be arranged in such a way that the vowels always come together ?

(a)840

(b)86400

(c)8400

(d)1440

(e) None of these

Q40.

A committee of 3 members is to be formed out of 3 men and 4 women. In how many different ways can it be done so that at least one member is a woman ?

(a)34

(b)12

(c)30

(d)36

(e) None of these

Q41.

9.4 boys and three girls are to be seated in a row in such a way that no two boys sit adjacent to each other. In how many different ways can it be done ?

(a)5040

(b)30

(c)144

(d)72

(e) None of these

Q42.

How many different words can be formed with the letters of the word 'ALLAHABAD' ?

(a)7500

(b)7560

(c)7510

(d)7580

(e) None of these

Q43.

In how many different ways can the letters of the word 'MIRACLE' be arranged?

(a)720

(b)5040

(c)2520

(d)40320

(e) None of these

Q44.

In how many different ways can the letters of the word 'PUNCTUAL' be arranged ?

(a)64

(b)40320

(c)960

(d)20160

(e) None of these

Q45.

Directions: Answer these questions on the basis of the information given below:From a group of 6 men and 4 women a Committee of 4 persons is to be formed - In, how. many different ways can it be done, so that the committee has at least 2 men ?

(a)210

(b)225

(c)195

(d)185

(e) None of these

Q46.

Directions : Read the following statement carefully to answer the given questions.A committee of 12 persons is to be formed from 9 women and 8 men. - In how many ways this can bedone if atleast 5 women have to be included in a committee ?

(a)6000

(b)6010

(c)6062

(d)6005

(e) None of these

Q47.

Directions : Read the following statement carefully to answer the given questions.A committee of 12 persons is to be formed from 9 women and 8 men. - In how many of these Commit-tees, the men are in majority ?

(a)1008

(b)1100
(c)1200
(d)1225
(e) None of these

Q48.
In how many different ways can the letters of the word 'PRIDE' be arranged ?
(a)60
(b)120
(c)15
(d)360
(e) None of these

Q49.
In how many different ways canthe numbers '256974' be arranged, using each digit only once in each arrangement, such that the digits 6 and 5 are at the extreme ends in each arrangement?
(a)48
(b)720
(c)36
(d)360
(e) None of these

Q50.
On a shelf three are 4 books on Economics, 3 books on Management and 4 books on Statistics. In how many different ways can the books be arranged so that the books on Economics are kept together?
(a)967680
(b)120960
(c)5040
(d)40320
(e) None of these

Q51.
In how many different ways can be letters of the word SOFTWARE be arranged in such a way that the vowels always come together?
(a)13440
(b)1440
(c)360
(d)120
(e) None of these

Q52.
Two girls and 4 boys are to be seated in a row in such a way that the girls do not sit together. In how many different ways can it be done?

(a)720
(b)480
(c)360
(d)240
(e) None of these

Q53.
In how many different ways canthe letters of the word DRASTIC be arranged in such a way that the vowels always come together ?
(a)720
(b)360
(c)1440
(d)540
(e) None of these

Q54.
In how many different ways can the letters of the word 'CASUAL' be arranged ?
(a)36
(b)720
(c)240
(d)360
(e) None of these

Q55.
A dinner party is to be fixed for a group of 100 persons. In this party, 50 persons do not prefer fish, 60 prefer chicken and 10 do not prefer either chicken or fish. Find the number of people who prefer both fish and chicken.
(a)20
(b)30
(c)40
(d)10
(e) None of these

Q56.
In how many different ways the letters of the word RECTITUDE can be arranged so that vowels come together ?
(a)4302
(b)7200
(c)4320
(d)4430
(e) None of these

ANSWERS :

	1 e	2 a	3 a	4 d	5 a	6 d	7 e	8 d	9 a	10 a	11 b	12 c	13 d	14
a	15 a	16 e	17 d	18 a	19 d	20 a	21 d	22 e	23 b	24 d	25 c	26 a	27 d	28
a	29 e	30 a	31 a	32 a	33 d	34 a	35 d	36 a	37 b	38 a	39 e	40 a	41 c	42b
	43 b	44 d	45 d	46 c	47 a	48 b	49 a	50 a	51 e	52 b	53 c	54 d	55 a	56
c														

1.(5) There are 8 letters in the word 'SOFTWARE' including 3 vowels (O,A,E) and 5 Consonants (S,F,T,W,R). Considering three vowels as one letter, we have six letters which can be arranged in $^6P_6 = 6|$ ways, But corresponding to each way of these arrangements, the vowels can be put together in $3|$ ways.

∴ Required number of words.

$= 6 | \times 3| = 4320$

2.(1) 4 men out of 7 men and 4 women out of 8 women can be chosen in $^7C_4 \times {}^8C_4$ ways

$= (7 \times 6 \times 5 \times 4)/(1 \times 2 \times 3 \times 4) \times (8 \times 7 \times 6 \times 5)/(1 \times 2 \times 3 \times 4)$

$= 35 \times 70 = 2450$

3.(1) A team of 5 children consisting of at least two girls can be formed in following ways:

I. Selecting 2 girls out of 4 and 3 boys out of 5. This can be done in $^4C_3 \times {}^5C_3$ ways.

II. Selecting 3 girls out of 4 and 2 boys out 5. This can be done in $^4C_3 \times {}^5C_2$ ways.

Selecting 4 girls out of 4 and 1 boy out of 5. This can be done in $^4C_4 \times {}^5C_1$

Since the team is formed in each case, therefore, by the fundamental principal of addition, the total number of ways forming the team.

$= {}^4C_2 \times {}^5C_3 + {}^4C_3 \times {}^5C_2 + {}^4C_4 \times {}^5C_1$

$=[4 \times 3/ 1 \times 2] \times [5 \times 4 \times 3/1 \times 2 \times 3] + [4 \times 3 \times 2/ 1 \times 2 \times 3] \times [5 \times 4/1 \times 2] + 1 \times 5$

$= 60 + 40 + 5 = 105$

4.(4) The work PADDLED consists of seven letters out of which the letter D is repeated thrice.

∴ Required number of arrangements

$= 71/31 = 7 \times 6 \times 5 \times 4 = 840$

5.(1) The work BLOATING has eight distinct letters.

∴ Number of arrangements $= 81$

$= 8 \times 7 \times 6 \times 5 \times 3 \times 2 \times 1 = 40320$

6.(4) The word CREATE consists of 6 letters in which E comes twice.

∴ Number of arrangements $= 6|/2|$

$= (6 \times 5 \times 4 \times 3 \times 2 \times 1)/(2 \times 1) = 360$

7.(5) The word SMART has 5 distinct letters.

∴ Number of arrangements

$= 5 \times 4 \times 3 \times 2 \times 1 = 120$

8.(4) Number of selections = Number of ways of selecting 2 men out of 5 men x number of ways of selecting 1 woman out of 3 women.

$= {}^5C_2 \times {}^3C_1 = (5 \times 4)/(1 \times 2) \times 3 = 30$

9.(1) The word DESIGN consists of 2 vowel & 4 consonants.

V C C C C V

Four consonants can be arranged in $4|$ ways two vowels can be arranged in $2|$ways

Required number of arrangements $= 4| \times 2| = 48$

10.(1) The committee will be formed as follows:

(i) 1 woman and 2 men

(ii) 2 women and 1 man

(iii) women

∴ Required number of committees

$= {}^5C_1 \times {}^4C_2 + {}^5C_2 \times {}^4C_1 + {}^5C_3$

$= 5 \times (4 \times 3)/(1 \times 2) + (5 \times 4)/(1 \times 2) \times 4 + (5 \times 4 \times 3)/(1 \times 2 \times 3)$

$= 30 + 40 + 10 = 180$

11.(2) The word TOTAL has 5 letters in which T comes twice.

∴ Total number of arrangements

$= 5|/2| = (5 \times 4 \times 3 \times 2 \times 1)/ (2 \times 1) = 60$

12.(3) Number of selections

$= {}^8C_5 = {}^8C_3$

$[^nC_r = {}^nC_{n-r}] = (8 \times 7 \times 6)/(1 \times 2 \times 3) = 56$

13.(4) The word AWARE consists of 5 letters in which letter 'A' comes twice.

∴ Number of arrangements $= 5|/2|$

$= (5 \times 4 \times 3 \times 2 \times 1)/ (2 \times 1) = 60$

14.(1) The word 'OFFICES' consists of 7 letters out of which letter 'F' cornes twice.

∴ Total number of arrangements

$= 7| /2|$

$= (7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1)/ (2 \times 1) = 2520$

15.(1) The word TRUST consists of five letters in which T comes twice.

∴ Number of arrangements $= 5| /2|$

$= (5 \times 4 \times 3 \times 2 \times 1)/ (2 \times 1) = 60$

16.(5) The word ATTEND consists of 6 letters in which letter T comes twice.

∴ Number of arrangements $= 6| /2|$

$= (6 \times 5 \times 4 \times 3 \times 2 \times 1)/(2 \times 1)$

$= 360$

17.(4) The word BANKING consists of 7 letters in which 'N' comes twice

∴ Number of arrangements $= 7| /2|$

$= (7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1)/(2 \times 1)$

$= 2520$

18.(1) The word PEANUT consists of 6 distinct letters.

∴ Number of arrangements $= 6|$

$= 6 \times 5 \times 4 \times 3 \times 2 \times 1 = 720$

19.(4) Required number of combinations

$= {}^4C_2 \times {}^3C_2 \times {}^2C_1$

$= (4 \times 3)/(1 \times 2) \times (3 \times 2)/(1 \times 2) \times 2 = 36$

20.(1) Required number of combinations

$= {}^9C_2 = (9 \times 8 \times 7 \times 6 \times 5)/ (1 \times 2 \times 3 \times 4 \times 5) = 126$

21.(4) The word LEASE consists of 5 letters in which E comes twice.

∴ Number of arrangements $= 5| /2|$

$= (5 \times 4 \times 3 \times 2 \times 1)/(2 \times 1) = 60$

22.(5) The word CYCLE has 5 letters in which letters comes twice.

∴ Number of arrangements $= 5| / 2|$

$= (5 \times 4 \times 3 \times 2 \times 1)/(2 \times 1) = 60$

23.(2) Required number of committees

$= (4c \times 5c_2 \times 3c_2)$

$= (4 \times 3)/(1 \times 2) \times (5 \times 4)/(1 \times 2) \times (3 \times 2)/(1 \times 2)$

$= 6 \times 10 \times 3 = 180$

24.(4) Required number of committees

$=$ Selection of 6 teachers from science and arts teachers

$= 9c_6 = 9c_3$

$[∴ {}^nC_r = {}^nC_{n-r}]$

$= (9 \times 8 \times 7)/ (1 \times 2 \times 3) = 84$

25.(3) Required number of committees = Selection out of all the teachers

$= {}^{12}C_6$

$= (12 \times 11 \times 10 \times 9 \times 8 \times 7)/(1 \times 2 \times 3 \times 4 \times 5 \times 6) = 924$

26.(1) The word PRAISE consists of 6 distinct letters.

∴ Number of arrangements $= 6|$

= 6 × 5 × 4 × 3× 2× 1 = 720

27.(4) The word THERAPY consists of 7 distinct letters in which E,A are two vowels.
We get THRPY (EA) keeping EA together as single entity.
Number of permutations when vowels are together
 = 6| × 2|
∴ Required number of arrangements = 7| - 1440
 = 5040 – 1440 = 3600

28.(1) The word VISITING has 8 letters in which I comes thrice.
∴ Number of arrangements = 8| / 3|
 = 8 × 7 × 6 × 5 × 4 = 6720

29.(5) The word REPLACE consists of 7 letters in which 'E' comes twice.
∴ Number of arrangements = 7| /2|
 = 7 × 6 × 5 × 4 × 3 = 2520

30. The Word SACRED consists of 4 consonants (SCRD) and two vowels (AE). On keeping vowels together we get SCRD (AE).
∴ Number of arrangements
 = 5| × 2|
= 5 × 4 × 3 × 2 × 1 × 1 × 2
 = 240

31.(1) The word RUMOUR consists of 6 letters in which each of R and U comes twice.
∴ Number of arrangements
= 6|/2| 2| = (6 × 5 × 4 × 3 × 2 × 1)/(2×2)
 = 180

32.(1) In the word CANDIDATE, letters C,N,D,D,T are consonants and A,I,A,E are vowels.
We have to arrange C,N,D,D,T (A, I, A, E) in which 'D' comes twice and A comes twice.
∴ Number of arrangements
= (6| × 4|) / 2| 2|
 = (6 × 5 × 4 × 3× 2 × 4 ×3× 2)/ (2 × 2)
 = 4320

33.(4) Number of committees.
 = $^4C_4 × ^6C_1 + ^3C_3 × ^4C_2$
= 1 × 6 + 1 × (4 × 3)/(1 × 2)
 = 6 + 6 = 12

34.(1) No. of ways = 4| × 4|
 = 24 × 24 = 576 ways

35.(4) No. of ways
= $^6c_4 + (^6c_3 × ^4c_1) + (^6c_2 × ^4c_2) + (^6c_1 × ^4c_3)$
 = 15 + (30 × 5) + (15 × 6) + (6 × 4)
 = 15 + 80 + 90 + 24 = 209

36.(1) Total members in the family = 11
No. of males = 4
No. of females = 7
 No. of cars hired = 3
No. car can have more than 4 members. So the possible combinations can be such that one car has 3 members and the other two cars 4 each.
Further, each car must have at least one male. The total no. of males is 4. So, only one car will have 2 males and the rest one each.

Option :	I	II	III
Total members	3	4	4
Possible combination:	1m and 2f	1m and 3f	1m and 2f
	or (2m and 1f	or 2m and 2f	or 1m and 3f)
			×2

No. of ways : [$^4c_1 × ^7c_2 + ^4c_1 × ^7c_3 + ^4c_2 × ^7c_2 + ^4c_2 × ^7c_1 + ^4c_2 × ^7c_2 + ^4c_1 × ^7c_3$] × 2
 =(4 × 21 + 4 × 4 × 35 + 6 × 21 + 6 × 7 + 6 × 21 + 4 × 35) × 2
 = 126 + 266 + 266
 = Total no. ways
 = 126 + 266 + 266 = 658

37.(2) 4 boys can be seated in a row in $^4P_4 = 4|$ ways
Now in the 5 gaps 2 girls can be arranged in $^5P_2$ ways
 Hence, the number of ways in which no two girls sit together
= 4| × $^5P_2$ = 4 × 3 × 2 × 5 × 4
= 480

38.(1) There are 7men and 3 women. We have to select 5 men out of 7 and 2 women out of 3. This can be done in $^7C_5 × ^3C_2$ way
 ∴ The number of ways of making the selection
= $^7C_5 × ^3C_2$
= $^7C_2 × ^3C_2$
[∵ $^nC_r = ^nC_{n-r}$]
= (7 × 6)/(1 ×2) × (3 × 2)/(1×2) = 63

39.(5) There are 11 letters in the word 'CORPORATION' of which three are O's, two are R's and all others are distinct. There are 5 vowels viz, O,O,O,IA.
Considering these 5 vowels as the one letter we have 7 letters (C,R,R,N,T,P and letter obtained by combining all vowels), out of which R occurs twice.
These 7 letters can be arranged in 7| / 2| ways.
 But the 5 vowels (O,O,O, I, A)
 can be put together in 5| / 3| way
Hence, the number of arrangements in which vowels are always together 7|/2| / 5|/3|
= (7 × 6 × 5 × 4 × 3 × 2 × 5× 4× 3 × 3×2)/(2 × 3 × 2)
 = 50400

40.(1) The committee can be formed in the following ways;
(i) By selecting 2 men and 1 women
(ii) By selecting 1 man and 2 women
(iii) By selecting 3 women
∴ Total number of ways of forming the committee
 = $3c_2 × 4c_1 + 3c_1 × 4c_2 + 4c_3$
= 3 × 4 + 3 × 6 + 4
 = 12 + 18 + 4 = 34

41.(3) 3 Girls can be seated in a row in 3| ways. Now, in the 4 gaps 4 BGBGBGB boys can be seated in 4| ways
Hence, the number of ways in which no two boys sit adjacent to each other
= 3| × 4| = 6 × 24 = 144

42.(2) There are 9 letters in the word ALLAHABAD out of which 4 are A's 2 are L's and the rest are all distinct.
So, the requisite number of words
= 9|\ 4|2| = 7560

43.(2) The word MIRACLE has 7 distinct letters.
∴ Number of arrangements = 7|
 = 7 × 6 × 5 × 4 × 3 × 2 × 1 = 5040

44.(4) The word PUNCTUAL consists of 8 letters in which the letter 'U' comes twice.

∴ Number of arrangements = 8| / 2|
= (8 × 7 × 5 × 4 × 3 × 2 × 1)/(1 × 2)
 = 20160

(15-16): There are 6 men and 4 women. A committee of 4 persons is to be formed amongst these 6 m and 4w.

45.(4) The committee of 4 persons is to be so formed that it has at least 2 men. The different ways that we can choose to form such a committee:

(1) 2m. 2w in $^6C_2 \times {}^4C_2$
 = (6 × 5)(2 × 1) × (3 × 3)/(2 × 1) = 90
 (ii) 3m. 1w in $^6C_3 \times {}^4C_1$
= (6 × 5 × 4)/(3 × 2 × 1) × 4 = 15

∴ Total no. of different ways in which a committee of 4 persons can be formed so that it has at least 2 men
= 90 + 80 + 15 = 185

46.(3) There are 9 women and 8 men. A committee of 12, consisting of at least 5 women, can formed by choosing:
(i) women and 7 men
(ii) 6 women and 6 men
(iii) 7 women and 5 men
(iv) 8 women and 4 men

∴ Total number of ways of forming the committee
= $^9C_5 \times {}^8C_7 + {}^9C_6 \times {}^8C_6 + {}^9C_7 \times {}^8C_5 + {}^9C_8 \times {}^8C_4 + {}^9C_9 \times {}^8C_3$
= 126 × 8 + 84 × 28 + 36 × 56 + 9 × 70 + 1 × 56 = 6062

47.(1) Men are in majority in only
(i) case as discussed in question 17.
∴ Total number of such committees
= $^9C_5 \times {}^8C_7$ = 126 × 8 = 1008

48.(2) Total word PRIDE consists of 5 distinct letters.
 ∴ Number of arrangements = 5|
 = 5 × 4 × 3 × 2 × 1 = 120

49.(1) Case I | 6 | | | | 5 |

Four empty places can be filled by 2,9,7,and4 in4| i.e. 4 × 3 × 2 × 1 = 24 ways

Case II | 5 | | | | 6 |

Number of arrangements = 24
∴ Required number of arrangements = 24 + 24 = 48

50.(1) Books on Economics are to be kept together. Hence, we are to arrange 3 books on management 4 books on Statistics and one book on Economics. These can be arranged in 8| ways.

Again, 4 books on Economics can be arranged together in 4| ways.
∴ Total number of arrangements = 8| × 4| = 967680

51.(5) There are 8 letters in the word 'SOFTWARE', including 3 vowels (O,A,E) and 5 consonants (S,F,T,W,R). Considering three vowels as one letter, we have six letters which can be arranged in $^6P_6 = 6|$ ways.
But corresponding to each way of these arrangements the vowels can be put together in 3| ways.
∴ Required number of words
 = 6| 3| = 4320

52.(2) 4 boys can be seated in a row in $^4P_4 = 4|$ ways
Now in the 5 gaps 2 girls can be seated in $^5P_2$ ways
Hence, the number of ways in which no two girls sit together
= 4| × $^5P_2$ = 4 × 3 × 2 × 5 × 4
 = 480

53.(3) There are7 letters in the word 'DRASTIC' including 2 vowels (A.I) and 5 consonants (D,R,S,T,C). Considering two vowels as one letter, we have 6 letters which can be arranged in 6| ways. But corresponding to each way of these arrangements, the vowels can be put together in 2| ways
∴ Total arrangements
= 6| × 2| = 1440

54.(4) The word CASUAL has 6 letters in which letter 'A' comes twice.
∴ Number of arrangements = 6| /2|
 = (6 × 5 × 4 × 3 × 2 × 1)/(1 × 2) = 360

55.(1) n(F) = 50n (C) = 60
 n(FUC) = 100 – 10 = 90
 ∴ n(F⌒C) = n(F) + n(C) – n (FUC)
 = 50 + 60 – 90 = 20

56.(3) The word RECTITUDE has 9 letters in which RCTTD are consonants and EIUE are vowels and T and E come twice.
We have to arrange
RCTTD (EEIU)
∴ Number of arrangement
= (6| × 4|)/ (2| × 2|)
= 6 × 5 × 4 × 3 × 2 × 3 × 2
 = 4320