Permutation & Combination Questions for SBI PO Pre, IBPS PO Pre, SBI Clerk Mains, IBPS Clerk Mains & LIC AAO Exams.

Direction: Read the following questions carefully and choose the right answer.

1. Among the arrangements that can be made by using all the letters of the word "NATION", in how many arrangements N's come together?

A. 5! B. $\frac{6!}{2!}$ C. $\frac{5!}{2!}$ D. $\frac{4!}{2!}$ E. 6!

2. In how many ways can the letters of the word 'PARAGLIDING' be arranged such that all the vowels occur together?

A. 88322 ways B. 120960 ways C. 740 ways D. 144868 ways E. None of these

3. Five people out of whom only two can drive are to be seated in a five seater car with two seats in front and three in the rear. The people who know driving don't sit together. Only someone who knows driving can sit on the driver's seat. Find the number of ways the five people can be seated.

A. 40 B. 60 C. 48 D. 36 E. None of these

4. A boy is playing a Snake & Ladder game; he is on 91 and has to get to 100 to complete the game. There is a snake on 93 and 96. In how many ways he can complete the game, if he doesn't want to roll the dice more than three times.

A. 20 B. 15 C. 16 D. 18 E. 19

5. 8 members are to be selected from a group of 9 males and 7 females. In how many ways will the members with at most 3 females and at least 4 males be selected?

A. 6472 ways B. 6286 ways C. 6435 ways D. 6225 ways E. None of these

6. A chess board has rows and columns marked A to H and 1-8. Aman has a knight and a rook which he has to place on the board such that the two pieces are not in same row or column, what is total number of ways he can place the two pieces?

A. 3072 B. 3136 C. 6272 D. 6144 E. None of these

7. Mukesh is the faculty in-charge of school's debate team. He has to select a team of 5 members for inter-school debate competition. A group of 7 boys and 8 girls are members of the debate club and the team must be selected from these members only. The rules of the competition says that each team must consist of at least 1 girl. Hence, Mukesh must have at least 1 girl in his team. In how many ways can Mukesh select his team?

A. 2982   B. 3150   C. 2754   D. 2850   E. 2684

8. In a supermarket, there are six different Chocos packets, four different Biscuit packets and two different Namkeen packets are to be arranged on a shelf so that the Chocos packet stand together, the Biscuit packet stand together and the Namkeen packet stand together. How many such arrangements are possible?

A. 203760   B. 207360   C. 260730   D. 270630   E. 270360

9. Five people are to be arranged on five chairs for a photograph such that three people among them do not want to sit next to each other. Find out the number of ways in which this can be done.

A. 15   B. 24   C. 12   D. 8   E. None of these

10. A square table has two seats on each side. A total of 10 people are there. In how many ways the seats of the table can be filled?

A. $\frac{10!}{64}$ B. $\frac{10!}{4}$ C. $\frac{10!}{16}$ D. $\frac{10!}{32}$ E. $\frac{10!}{8}$

11. How many three letter words can be formed using the letters of the word "PRACTICES"?

A. 56   B. 336   C. 216   D. 357   E. None of these

12. Six students sitting in a row are given one toffee each from three types of toffees such that no two adjacent child gets same type of toffee. In how many ways can the toffees be distributed among the students?

A. 120   B. 24   C. 96   D. 48   E. None of these

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

A. 2620 ways   B. 2420 ways   C. 2520 ways   D. 2320 ways   E. 2120 ways

14. An objective test with all the questions mandatory to be answered can be attempted in 127 ways such that the student gets atleast one question right. Find the number of ways in which he can answer 4 questions correctly.

A. 44   B. 35   C. 28   D. Can't be determined   E. None of these

15. A postmaster wants to get delivered 6 letters at six different addresses. In the post office there are 2 postmen then in how many ways can the postmaster send the letters at different addresses through the postmen?

A. $\dfrac{6!}{2!}$ B. 6! × 2!   C. 64   D. 36   E. None of these

16. In a school, there are two students: one boy and one girl. The class teacher distributes some number of books between the two students. If each student is eligible for any number of books then the number of ways the class teacher can distribute the books is 1024. Find how many books the class teacher has?

A. 12   B. 8   C. 10   D. 32   E. None of these

17. In a Job opening, 25 girls and 75 boys applied. The interviewer can select either a girl or a boy for the job. In how many ways the interviewer can make this selection?

A. $^{25}C_1 \times {}^{75}C_1$ B. $(^{25}C_1 \times {}^{75}C_1)/2$ C. $^{75}C_2 \times {}^{25}C_2$ D. $(^{75}C_2 \times {}^{25}C_2)/2$ E. None of these

18. In a class there are 15 students. It was to divide in two groups, A and B. The number of students in group A should be 7 and the number of students in group B should be 8. In how many ways, groups can be formed?

A. 12870 ways   B. 4290 ways   C. 17160 ways   D. 3432 ways   E. None of these

19. An examination consists of total 5 objective and 5 subjective questions. In how many ways, a student can solve 8 questions out of which 5 are objective and 3 are subjective?

A. 10 ways   B. 50 ways   C. 20 ways   D. 25 ways   E. None of these

20. How many numbers are there in between 100 and 1000 such that exactly one of their digits is 3 if repetition is not allowed?

A. 100   B. 200   C. 300   D. 525   E. None of these

21. In a room everybody shakes hands with everybody else. The total number of hand-shakes is 66. The total number of persons in the room is:

A. 11   B. 14   C. 10   D. 12   E. None of these

22. A shop has four types of fowlers namely - Tulip, Rose, Marigold and Lily. A person came in to buy 10 flowers such that he has at least one flower of each type. In how many ways can he do so, if the shop has sufficient amount of flowers of each type?

A. 84   B. 60   C. 24   D. 30   E. None of these

23. Twenty families, each comprising five members attend a wedding reception and exchanged a Diwali greetings card with every other person of a different family exactly once. Find the total number of card exchanges happening at the reception.

A. 10000   B. 9025   C. 9500   D. 11400   E. None of these

24. A volleyball team of 6 players is to be selected from a group of 8 male and 7 female players. In how many ways is the team selected such that at most two female players are there in the team.

A. 1470   B. 1598   C. 1762   D. 1890   E. None of these

25. A volley ball team of six players is to be selected from a group of 9 male players 'x' female players. Find the value of 'x', if the number of ways to select a team having exactly two female players is equal to 1890.

A. 6   B. 7   C. 8   D. 9   E. None of these

26. There are 5 English, 4 Hindi and 3 regional newspaper options available in a library. In how many ways the owner can subscribe to five newspapers such that there are at least two English and two Hindi newspapers?

A. 230   B. 240   C. 220   D. 280   E. None of these

27. In how many ways the letters of the word "EXCITEMENT" can be arranged so that the distance between any two vowels is a multiple of 3?

A. 1380   B. 1200   C. 1440   D. 1460   E. None of these

28. Varun and Alia go to McDonald's. They both want to eat a meal which comprises of two burgers, one French fries, one cold drink and a dessert. There are 5 types of burgers, 2 types of French fries, 3 types of cold drinks and 5 types of desserts available. They will eat different burgers from each other and both the burgers in their meal will also be different, but they will have the same dessert. What is the number of ways in which they can place the order?

A. 27000   B. 5400   C. 21600   D. 4800   E. None of these

29. In a singing reality show 8 boys and 4 girls are selected from auditions and they are to be divided into teams of three captains Shaan, Niti and Mika. Two particular girls will join only Niti's Team and rest of the two girls will not be together. In how many ways the participants can be divided into teams?

A. 1120   B. 2400   C. 2240   D. 1680   E. None of these

30. There are three rows with three seats in each row. Four boys and two girls are to be seated in these three rows such that girls always sit in the last row. In how many ways the students can be seated?

A. 3490   B. 5040   C. 2880   D. 4560   E. None of these

31. Aana has 3 fifty rupee notes, 4 hundred rupee notes and 6 five hundred rupee notes in his pocket. If 2 notes are taken at random, what are the odds in favour of both notes being hundred rupee notes?

A. 1 : 13   B. 3 : 14   C. 4 : 19   D. 1 : 12   E. None of these

32. In how many different ways, the letters of the word 'CAPITA' can be arranged?

A. 360   B. 580   C. 620   D. 720   E. None of these

33. In how many different ways can the letters of the word "PATIENT" be arranged so that all the vowels come together?

A. 420   B. 450   C. 360   D. 320   E. None of these

34. In how many different ways can the letters of the word 'OPTICAL' be arranged so that be the vowels always come together?

A. 48   B. 120   C. 540   D. 720   E. None of these

35. In how many different ways letters of the word "EDUCATION" can be arranged such that all the consonants come together?

A. 18720   B. 18270   C. 17280   D. 12780   E. None of these

36. In how many different ways can the letters of the word "MARRIAGE" be arranged such that all the vowels come together?

A. 720   B. 360   C. 180   D. 540   E. None of these

37. A six letter word is to be formed by using at least two vowels in it. How many such words can be formed (not necessarily meaningful) if all the letters in word are different?

A. 53349120   B. 53439120   C. 53431920   D. 54339120   E. 53493120

38. In a badminton competition involving some men and women of a society, every person had to play exactly one game with every other person. It was found that in 36 games both the players were men and in 78 games both the players were women. Find the number of games in which one player was a man and other was a woman.?

A. 127   B. 117   C. 138   D. 146   E. None of these

39. What is the difference between the number of ways when three consecutive letters of the word 'ALLAHABAD' is selected in which two letters are same and the number of ways when two consecutive letters of the word 'BANGALORE' is selected in which one letter is vowel while other is consonant?

A. 4   B. 3   C. 7   D. 5   E. None of these

40. In how many different ways the letters of the word 'UGANDA' can be arranged such that 'G' always comes at first place and 'N' always comes at last place ?

A. 60   B. 360   C. 12   D. 24   E. 720

41. A five – letter word is to be formed from a group of 5 vowels and 4 consonants, using at least one vowel and at least one consonant. In how many ways the word having greater number of consonants than vowels can be formed?

A. 40   B. 42   C. 45   D. 52   E. 60

42. A committee of 8 members is to be selected from a group of 12 male and 10 female members. In how many ways the committee is selected such that at most two and at least one male member are there in the committee?

A. 13540   B. 14200   C. 15300   D. 16400   E. None of these

43. If a team of 4 persons is to be selected from 8 males and 8 females, then in how many ways can the selections be made to include at least 1 female.

A. 3500   B. 1875   C. 1750   D. 3000   E. None of these

44. Find the number of ways in which mixed double tennis game can be arranged amongst 9 married couples if no husband and wife play in the same game.

A. 1515 ways   B. 1500 ways   C. 1512 ways   D. 1550 ways   E. None of these

45. A basketball team of 5 players is to be selected from a group of 10 men and 8 women players. A volley ball team of 6 players is to be selected from a group of 8 men and 7 women players. Find the difference in the number of ways in which both the teams are selected, given that each team has only 2 female players.

A. 1890   B. 1920   C. 1950   D. 1990   E. None of these

46. Four letters are selected from the word "CAPAME" and are rearranged to form four letter words. How many words can be formed?

A. 120   B. 90   C. 180   D. 168   E. 192

47. A, B, C, D and E sit on five chairs all of which are facing north. C will sit only on the leftmost chair and B will not sit anywhere to the left of A. In how many ways they can be seated?

A. 10   B. 18   C. 36   D. 12   E. None of these

48. Six boys and 4 girls are to be seated in two separate rows with five chairs each, such that two particular girls are always together and all the girls are not in the same row. In how many ways can they be seated?

A. 15 × 7!   B. 20 × 8!   C. 18 × 7!   D. (16 × 8! – 4! × 6!)   E. None of these

49. Three chairs are arranged in a row facing three other chairs. 4 boys and 2 girls are to be seated on these chairs such that girls are always facing each other. In how many ways can they be seated?

A. 96　　　　　B. 72　　　　　C. 144　　　　　D. 120　　　　　E. None of these

50. In how many ways the letters of the word "UNDERDOG" can be arranged such that the first and last letters are same and no two vowels are together?

A. 72　　　　　B. 96　　　　　C. 132　　　　　D. 144　　　　　E. None of these

1. "NATION" शब्द के सभी अक्षरों का उपयोग करके जो व्यवस्था की जा सकती है, उनमें से N एक साथ कितनी बार है?

A. 5!   B. $\frac{6!}{2!}$ C. $\frac{5!}{2!}$ D. $\frac{4!}{2!}$ E. 6!

2. 'PARAGLIDING' शब्द के अक्षरों को कितने तरीकों से व्यवस्थित किया जा सकता है कि सभी स्वर एक साथ होते हैं?

A. 88322 तरीके   B. 120960 तरीके   C. 740 तरीके   D. 144868 तरीके   E. इनमें से कोई नहीं।

3. पांच लोग जिनमें से केवल दो ही ड्राइव कर सकते हैं, पांच सीटर कार में दो सीटों के साथ आगे और तीन पीछे की सीट पर बैठे हैं। जिन लोगों को ड्राइविंग की जानकारी है वे एक साथ नहीं बैठते हैं। केवल वह व्यक्ति जो ड्राइविंग जानता है, ड्राइवर की सीट पर बैठ सकता है। पांच लोगों को बैठाए जाने के तरीकों की संख्या ज्ञात करें।

A. 40   B. 60   C. 48   D. 36   E. इनमें से कोई नहीं।

4. एक लड़का एक साँप और सीढ़ी का खेल खेल रहा है; वह 91 पर है और खेल को पूरा करने के लिए 100 पर जाना है। 93 और 96 पर एक सांप है। वह कितने तरीकों से खेल को पूरा कर सकता है, यदि वह पासा को तीन बार से अधिक रोल करना नहीं चाहता है।

A. 20   B. 15   C. 16   D. 18   E. 19

5. 8 सदस्यों को 9 पुरुषों और 7 महिलाओं के समूह से चुना जाना है। अधिकतम 3 महिलाओं और कम से कम 4 पुरुषों के साथ सदस्यों को कितने तरीकों से चुना जाएगा?

A. 6472 तरीके   B. 6286 तरीके   C. 6435 तरीके   D. 6225 तरीके   E. इनमें से कोई नहीं।

6. एक शतरंज बोर्ड में A से H और 1-8 के रूप में चिह्नित पंक्तियाँ और क़तार हैं। अमन के पास एक वजीर और एक हाथी है जिसे उसे बोर्ड पर रखना है जैसे कि दो मौहरे एक ही पंक्ति या क़तार में नहीं हैं, दो मौहरे को रखने के कुल तरीकों की संख्या क्या है?

A. 3072   B. 3136   C. 6272   D. 6144   E. इनमें से कोई नहीं।

7. मुकेश स्कूल की वाद-विवाद टीम के संकाय प्रभारी हैं। उसे इण्टर विद्यालय वाद-विवाद प्रतियोगिता के लिए 5 सदस्यों की एक टीम का चयन करना है। 7 लड़कों और 8 लड़कियों के एक समूह वाद-विवाद क्लब के सदस्य हैं और टीम को केवल इन सदस्यों में से चुना जाना चाहिए। प्रतियोगिता के नियम कहते हैं कि प्रत्येक टीम में कम से कम 1 लड़की होनी चाहिए। इसलिए, मुकेश की टीम में कम से कम 1 लड़की होनी चाहिए। मुकेश अपनी टीम का चयन कितने तरीकों से कर सकते हैं?

A. 2982   B. 3150   C. 2754   D. 2850   E. 2684

8. एक सुपरमार्केट में, छह अलग-अलग चोकोस पैकेट, चार अलग-अलग बिस्किट पैकेट और दो अलग-अलग नमकीन पैकेटों को एक शेल्फ पर व्यवस्थित किया जाना है ताकि चोकोस पैकेट एक साथ रखे हों, बिस्किट पैकेट एक साथ रखे हों और नमकीन पैकेट एक साथ रखे हों। ऐसी कितनी व्यवस्थाएं संभव हैं?

A. 203760   B. 207360   C. 260730   D. 270630   E. 270360

9. एक तस्वीर के लिए पांच लोगों को पांच कुर्सियों पर बिठाया जाना है ताकि उनके बीच के तीन लोग एक-दूसरे के बगल में बैठना न चाहें। यह करने के तरीकों की संख्या ज्ञात करें।

A. 15   B. 24   C. 12   D. 8   E. इनमें से कोई नहीं।

10. एक वर्गाकार मेज के प्रत्येक तरफ दो सीटें हैं। कुल 10 लोग हैं। तालिका की सीटें कितने तरीकों से भरी जा सकती हैं?

A. $\dfrac{10!}{64}$ B. $\dfrac{10!}{4}$ C. $\dfrac{10!}{16}$ D. $\dfrac{10!}{32}$ E. $\dfrac{10!}{8}$

11. शब्द "PRACTICES" के अक्षरों का उपयोग करके कितने तीन अक्षर वाले शब्द बनाए जा सकते हैं?

A. 56   B. 336   C. 216   D. 357   E. इनमे से कोई नहीं

12. एक पंक्ति में बैठे छह छात्रों को तीन प्रकार के टॉफियों में से प्रत्येक को एक टॉफी दी जाती है, ताकि किसी भी दो आसन्न बच्चे को एक ही प्रकार की टॉफी न मिले। छात्रों के बीच टॉफियों को कितने तरीकों से वितरित किया जा सकता है?

A. 120   B. 24   C. 96   D. 48   E. इनमें से कोई नहीं

13. शब्द "Thoughts" के अक्षरों को कितने अलग-अलग तरीकों से इस तरह से व्यवस्थित किया जा सकता है कि स्वर हमेशा एक साथ आते हैं?

A. 2620 तरीके   B. 2420 तरीके   C. 2520 तरीके   D. 2320 तरीके   E. 2120 तरीके

14. एक वस्तुनिष्ठ परीक्षा जिसके सभी प्रश्नों का उत्तर देना अनिवार्य है, को 127 तरीकों से हल किया जा सकता है, जैसे कि छात्र का एक प्रश्न सही होता है। उन तरीकों की संख्या ज्ञात करें जिसमें वह 4 प्रश्नों का सही उत्तर दे सके।

A. 44   B. 35   C. 28   D. निर्धारित नहीं किया जा सकता है   E. इनमें से कोई नहीं।

15. एक पोस्टमास्टर छह अलग-अलग पते पर 6 पत्रों को वितरित करना चाहता है। डाकघर में 2 डाकिया हैं तो पोस्टमास्टर पोस्टमैन के माध्यम से विभिन्न पते पर पत्र कितने तरीकों से भेज सकता है?

A. $\frac{6!}{2!}$ B. 6! × 2!   C. 64   D. 36   E. इनमे से कोई नहीं

16. दो मिश्रण A और B दो अलग अलग बर्तनों में रखे गये हैं| मिश्रण A में सामग्री P, Q और R क्रमश: 3 : 5 : 2 के अनुपात में है तथा मिश्रण B में सामग्री P और Q क्रमश: 4 : 5 के अनुपात में है| हमें मिश्रण A और B को 1:2 के अनुपात में मिलाकर 540 लीटर का नया मिश्रण बनाना है तो अंतिम मिश्रण में सामग्री P की मात्रा कितनी होगी?

A. 12   B. 8   C. 10   D. 32   E. इनमे से कोई नहीं

17. दो मिश्रण में, पहले मिश्रण में दूध और पानी का अनुपात क्रमशः 5: 2 है और दूसरे समाधान में पानी और दूध का अनुपात क्रमशः 4: 3 है। दूध और पानी की समान मात्रा के साथ 28 लीटर का नया मिश्रण प्राप्त करने के लिए क्रमशः पहले घोल और दूसरे घोल के कितने लीटर को एक साथ मिलाया जाना चाहिए?

A. $^{25}C_1 \times {}^{75}C_1$ B. $(^{25}C_1 \times {}^{75}C_1)/2$ C. $^{75}C_2 \times {}^{25}C_2$ D. $(^{75}C_2 \times {}^{25}C_2)/2$
E. इनमें से कोई नहीं।

18. एक कक्षा में 15 छात्र हैं। यह दो समूहों, A और B में विभाजित थे। समूह A में छात्रों की संख्या 7 और समूह B में छात्रों की संख्या 8 होनी चाहिए। कितने तरीकों से, समूहों को घटित किया जा सकता है?

A. 12870 तरीकों से   B. 4290 तरीकों से   C. 17160 तरीकों से   D. 3432 तरीकों से
E. इनमें से कोई नहीं।

19. एक परीक्षा में कुल 5 बहु विकल्पीय और 5 व्यक्तिपरक प्रश्न हैं। कितने तरीकों से, एक छात्र 8 प्रश्नों को हल कर सकता है जिनमें से 5 बहु विकल्पीय हैं और 3 व्यक्तिपरक हैं?

A. 10 तरीके   B. 50 तरीके   C. 20 तरीके   D. 25 तरीके   E. इनमें से कोई नहीं।

20. 100 और 1000 के बीच कितनी संख्याएँ हैं जैसे कि उनके अंकों में से एक 3 है यदि पुनरावृत्ति की अनुमति नहीं है?

A. 100   B. 200   C. 300   D. 525   E. इनमें से कोई नहीं।

21. एक कमरे में हर कोई हर किसी के साथ हाथ मिलाता है। हाथ मिलाने की कुल संख्या 66 है। कमरे में व्यक्तियों की कुल संख्या है।

A. 11   B. 14   C. 10   D. 12   E. इनमें से कोई नहीं।

22. एक दुकान में ट्यूलिप, रोज, मैरीगोल्ड और लिली नामक चार प्रकार के फूल हैं। एक व्यक्ति 10 फूलों को खरीदने के लिए आया, जिसमें उसके पास प्रत्येक प्रकार का कम से कम एक फूल हो। वह कितने तरीकों से ऐसा कर सकता है यदि दुकान में प्रत्येक प्रकार के फूलों की पर्याप्त मात्रा है?

A. 84   B. 60   C. 24   D. 30   E. इनमें से कोई नहीं।

23. बीस परिवार, जिनमें से प्रत्येक में पांच सदस्य हैं, एक शादी के रिसेप्शन में शामिल होते हैं और अलग-अलग परिवार के प्रत्येक दूसरे व्यक्ति के साथ केवल एक बार दिवाली के शुभकामना कार्ड का आदान-प्रदान करते हैं। रिसेप्शन पर आदान-प्रदान होने वाले कार्ड की कुल संख्या ज्ञात कीजिए।

A. 10000   B. 9025   C. 9500   D. 11400   E. इनमें से कोई नहीं।

24. 8 पुरुष और 7 महिला खिलाड़ियों के समूह से 6 खिलाड़ियों की वॉलीबॉल टीम चुनी जानी है। टीम को कितने तरीकों से चुना जाता है, जबकि टीम में ज्यादातर दो महिला खिलाड़ी हैं।

A. 1470   B. 1598   C. 1762   D. 1890   E. इनमें से कोई नहीं

25. छह खिलाड़ियों की एक वॉली बॉल टीम को 9 पुरुष खिलाड़ियों 'X' महिला खिलाड़ियों के समूह में से चुना जाना है। 'X' का मान ज्ञात करें, यदि दो महिला खिलाड़ियों वाली टीम का चयन करने के तरीकों की संख्या 1890 के बराबर है।

A. 6   B. 7   C. 8   D. 9   E. इनमें से कोई नहीं।

26. एक पुस्तकालय में 5 अंग्रेजी, 4 हिंदी और 3 क्षेत्रीय समाचार पत्र उपलब्ध हैं। मालिक कितने तरीकों से पांच अखबारों खरीद सकता है जबकि कम से कम दो अंग्रेजी और दो हिंदी अखबार हैं?

A. 230   B. 240   C. 220   D. 280   E. इनमें से कोई नहीं।

27. "EXCITEMENT" शब्द के अक्षरों को कितने तरीकों से व्यवस्थित किया जा सकता है ताकि किसी भी दो स्वरों के बीच की दूरी 3 के गुणक में हो?

A. 1380   B. 1200   C. 1440   D. 1460   E. इनमें से कोई नहीं।

28. वरुण और आलिया मैकडॉनल्ड्स जाते हैं। वे दोनों एक भोजन करना चाहते हैं जिसमें दो बर्गर, एक फ्रेंच फ्राइज़, एक कोल्ड ड्रिंक और एक मिठाई शामिल है। 5 प्रकार के बर्गर, 2 प्रकार के फ्रेंच फ्राइज़, 3 प्रकार के कोल्ड ड्रिंक और 5 प्रकार की मिठाई उपलब्ध हैं। वे एक-दूसरे से अलग-अलग बर्गर खाएंगे और उनके खाने में दोनों बर्गर भी अलग-अलग होंगे, लेकिन उनके पास एक ही तरह की मिठाई होगी। उन तरीकों की संख्या कितनी है जिसमें वे आदेश दे सकते हैं?

A. 27000   B. 5400   C. 21600   D. 4800   E. इनमें से कोई नहीं।

29. एक सिंगिंग रियलिटी शो में 8 लड़कों और 4 लड़कियों को ऑडिशन से चुना जाता है और उन्हें तीन कप्तानों शान, नीती और मीका की टीमों में विभाजित किया जाता है। केवल दो लड़कियाँ नीती की टीम में शामिल होंगी और बाकी दो लड़कियाँ एक साथ नहीं होंगी। प्रतिभागियों को टीमों में कितने तरीकों से विभाजित किया जा सकता है?

A. 1120   B. 2400   C. 2240   D. 1680   E. इनमें से कोई नहीं।

30. प्रत्येक पंक्ति में तीन सीटों वाली तीन पंक्तियाँ हैं। चार लड़कों और दो लड़कियों को इन तीन पंक्तियों में बैठाया जाना है जैसे कि लड़कियां हमेशा अंतिम पंक्ति में बैठती हैं। छात्रों को कितने तरीकों से बैठाया जा सकता है?

A. 3490   B. 5040   C. 2880   D. 4560   E. इनमें से कोई नहीं।

31. आना की जेब में 3 पचास रुपए के नोट, 4 सौ रुपए के नोट और 6 पांच सौ रुपए के नोट हैं। यदि 2 नोटों को यादृच्छिक रूप से निकाला जाता है, तो दोनों नोटों के सौ रुपए के नोट होने की क्या संभावना हैं?

A. 1 : 13   B. 3 : 14   C. 4 : 19   D. 1 : 12   E. इनमें से कोई नहीं।

32. कितने अलग तरीकों से, 'CAPITA' शब्द के अक्षरों को व्यवस्थित किया जा सकता है?

A. 360   B. 580   C. 620   D. 720   E. इनमें से कोई नहीं।

33. शब्द "PATIENT" के अक्षरों को कितने अलग-अलग तरीकों से व्यवस्थित किया जा सकता है ताकि सभी स्वर एक साथ आए?

A. 420   B. 450   C. 360   D. 320   E. इनमें से कोई नहीं।

34. शब्द 'OPTICAL' के अक्षरों को कितने अलग-अलग तरीकों से व्यवस्थित किया जा सकता है ताकि स्वर हमेशा एक साथ आए?

A. 48   B. 120   C. 540   D. 720   E. इनमे से कोई नही।

35. ऐसे कितने विभिन्न तरीके है जिनमे "EDUCATION" शब्द के अक्षरों को ऐसे व्यवस्थित किया जाये की सारे व्यंजन एकसाथ आये?

A. 18720   B. 18270   C. 17280   D. 12780   E. इनमे से कोई नही।

36. शब्द "MARRIAGE" के अक्षरों को कितने अलग-अलग तरीकों से व्यवस्थित किया जा सकता है कि सभी स्वर एक साथ आते हैं?

A. 720   B. 360   C. 180   D. 540   E. इनमे से कोई नही।

37. कम से कम दो स्वरों का उपयोग करके एक छह अक्षर का शब्द बनना है। यदि शब्द के सभी अक्षर अलग हैं, तो ऐसे कितने शब्दों का गठन किया जा सकता है (जरूरी नहीं कि शब्द सार्थक हो)?

A. 53349120   B. 53439120   C. 53431920   D. 54339120   E. 53493120

38. एक बैडमिंटन प्रतियोगिता में समाज के कुछ पुरुषों और महिलाओं को शामिल किया गया था, प्रत्येक व्यक्ति को हर दूसरे व्यक्ति के साथ केवल एक खेल खेलना था। यह पाया गया कि 36 खेलों में दोनों खिलाड़ी पुरुष थे और 78 खेलों में दोनों खिलाड़ी महिलाएं थीं। उन खेलों की संख्या ज्ञात कीजिए जिनमें एक खिलाड़ी एक पुरुष और दूसरा एक महिला थी।

A. 127   B. 117   C. 138   D. 146   E. इनमे से कोई नही।

39. जब 'ALLAHABAD' शब्द के क्रमागत तीन अक्षरों को चुनने के तरीकों की संख्या, जिसमें दो अक्षर समान होते हैं और 'BANGALORE' शब्द के दो क्रमागत अक्षरों को चुनने के तरीकों की संख्या, जिसमें एक अक्षर स्वर है जबकि अन्य व्यंजन है के बीच अंतर क्या है ?

A. 4   B. 3   C. 7   D. 5   E. इनमें से कोई नहीं।

40. 'UGANDA' शब्द के अक्षरों को कितने अलग-अलग तरीकों से व्यवस्थित किया जा सकता है जैसे कि 'G' हमेशा पहले स्थान पर आता है और 'N' हमेशा अंतिम स्थान पर आता है?

A. 60   B. 360   C. 12   D. 24   E. 720

41. पांच स्वर और 4 व्यंजन के समूह से एक पाँच अक्षर वाला शब्द बनना है, कम से कम एक स्वर और कम से कम एक व्यंजन का उपयोग करना। स्वरों की तुलना में अधिक से अधिक व्यंजन रखने वाले शब्द को कितने तरीकों से बनाया जा सकता है?

A. 40   B. 42   C. 45   D. 52   E. 60

42. 12 पुरुष और 10 महिला सदस्यों के समूह से 8 सदस्यों की एक समिति का चयन किया जाना है। समिति को कितने तरीकों से चुना जाता है जिसमें अधिक से अधिक दो और कम से कम एक पुरुष सदस्य हैं?

A. 13540   B. 14200   C. 15300   D. 16400   E. इनमें से कोई नहीं।

43. यदि 4 व्यक्तियों की टीम को 8 पुरुषों और 8 महिलाओं से चुना जाना है, तो कम से कम 1 महिला को शामिल करने के लिए कितने तरीकों से चयन किया जा सकता है।

A. 3500   B. 1875   C. 1750   D. 3000   E. इनमें से कोई नहीं।

44. उन तरीकों की संख्या ज्ञात करें जिनमें mixed double tennis खेल को 9 विवाहित जोड़ों के बीच व्यवस्थित किया जा सकता है यदि कोई पति और पत्नी एक ही खेल में नहीं खेलते हैं।

A. 1515 तरीके   B. 1500 तरीके   C. 1512 तरीके   D. 1550 तरीके   E. इनमें से कोई नहीं।

45. 5 पुरुषों की एक बास्केटबॉल टीम को 10 पुरुष और 8 महिला खिलाड़ियों के समूह से चुना जाना है। 6 खिलाड़ियों की एक वॉली बॉल टीम को 8 पुरुष और 7 महिला खिलाड़ियों के समूह से चुना जाना है। दोनों टीमों को चुनने के तरीकों में अंतर का पता लगाएं, यह देखते हुए कि प्रत्येक टीम में केवल 2 महिला खिलाड़ी हैं।

A. 1890   B. 1920   C. 1950   D. 1990   E. इनमें से कोई नहीं।

46. चार अक्षर शब्द "CAPAME" से चुने गए हैं और चार अक्षर शब्द बनाने के लिए फिर से व्यवस्थित किए गए हैं। कितने शब्द बन सकते हैं?

A. 120　　　　　B. 90　　　　　C. 180　　　　　D. 168　　　　　E. 192

47. A, B, C, D और E पाँच कुर्सियों पर बैठते हैं और सभी कुर्सियां उत्तर की ओर हैं। C केवल सबसे बाईं ओर बैठेगा और B, A के बाईं ओर कहीं भी नहीं बैठेगा। उन्हें कितने तरीकों से बैठाया जा सकता है?

A. 10　　　　　B. 18　　　　　C. 36　　　　　D. 12　　　　　E. इनमे से कोई नहीं।

48. छह लड़कों और 4 लड़कियों को पांच कुर्सियों वाली दो अलग-अलग पंक्तियों में बैठाया जाना है, जैसे कि दो विशेष लड़कियां हमेशा एक साथ हैं और सभी लड़कियां एक ही पंक्ति में नहीं होती हैं। उन्हें कितने तरीकों से बैठाया जा सकता है?

A. 15 × 7!　　　B. 20 × 8!　　　C. 18 × 7!　　　D. (16×8! - 4!×6!)　　E. इनमे से कोई नहीं

49. तीन कुर्सियों को तीन अन्य कुर्सियों के सामने एक पंक्ति में व्यवस्थित किया गया है। 4 लड़कों और 2 लड़कियों को इन कुर्सियों पर बैठाया जाना है ताकि लड़कियां हमेशा एक-दूसरे का सामना कर सकें। उन्हें कितने तरीकों से बैठाया जा सकता है?

A. 96　　　　　B. 72　　　　　C. 144　　　　　D. 120　　　　　E. इनमें से कोई नहीं।

50. "UNDERDOG" शब्द के अक्षरों को कितने तरीकों से व्यवस्थित किया जा सकता है जैसे कि पहले और अंतिम अक्षर समान हैं और कोई दो स्वर एक साथ नहीं हैं?

A. 72　　　　　B. 96　　　　　C. 132　　　　　D. 144　　　　　E. इनमें से कोई नहीं।

CORRECT ANSWERS:

1	A	**11**	D	**21**	D	**31**	D	**41**	C
2	B	**12**	C	**22**	A	**32**	A	**42**	C
3	D	**13**	C	**23**	E	**33**	C	**43**	C
4	C	**14**	B	**24**	D	**34**	D	**44**	C
5	C	**15**	C	**25**	A	**35**	C	**45**	A
6	B	**16**	C	**26**	D	**36**	A	**46**	E
7	A	**17**	E	**27**	C	**37**	B	**47**	D
8	B	**18**	A	**28**	B	**38**	B	**48**	B
9	C	**19**	A	**29**	C	**39**	B	**49**	C
10	E	**20**	B	**30**	B	**40**	C	**50**	D

Join us

Explanations:

1. There are totally 6 letters of which N appear twice.

Total arrangements = 6!/2!

and the arrangements where N's are together are 5!

Hence, option A is correct.

2. In the word "PARAGLIDING" there are 11 letters in which there are 4 vowels (i.e. 2 A's and 2 I's) and 7 consonants (i.e 2 G's and each of P, R, L, D, N)

Considering vowel as one letter, the number of letters becomes 8 which can be arranged as

$$\frac{8!}{2!} = \frac{40320}{2} = 20160$$

Vowel A and I appear twice, so vowels can be arranged as

$$\frac{4!}{(2! \times 2!)} = \frac{24}{4} = 6$$

Hence the required number of ways in which the letters of the word "PARAGLADING" be arranged so that all the vowels occur together = 20160 × 6 = 120960

Hence, option B is correct.

3. Number of people who can drive = 2

Number of ways of selecting driver = $2C_1$

The other person who knows driving can be seated only in the rear three seats in 3 ways

Total number of ways of seating the two persons = $2C_1 \times 3$

Number of ways of seating remaining = 3!

Total number of all five can be seated = $2C_1 \times 3 \times 3! = 36$

Hence, correct answer is 36

Hence, option D is correct.

4. 91 --92 — 93 — 94 — 95 — 96 — 97 — 98 — 99 — 100

Total position advance needed = 100 – 91 = 9

One roll of dice can't complete the game.

If he completes in two roll of dice.

Possible dice throws are – (3&6), (4&5), (5&4), (6&3)

But (5&4) will bring the token on 96, so this is rejected.

If he completes the game in three roll of dices

First dice reading options are 1,3,4,6

After checking all option and rejecting those in which token reaches on 93 or 96

Possible dice throws are (1,2,6), (1,3,5),(1,5,3), (1,6,2) ;

(3,1,5),(3,3,3),(3,4,2),(3,5,1);

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

(6, 1, 2), (6, 2, 1)

Total number of ways = 16

Hence, option C is correct.

5. Case I: 5 males and 3 females can be selected
Number of ways of selection = $^9C_5 \times {}^7C_3$ = 126 × 35 = 4410

Case II: 6 males and 2 females can be selected
Number of ways of selection = $^9C_6 \times {}^7C_2$ = 84 × 21 = 1764

Case III: 7 males and 1 female can be selected
Number of ways of selection = $^9C_7 \times {}^7C_1$ = 36 × 7 = 252

Case IV: 8 males can be selected
Number of ways of selection = $^9C_8$ = 9

So, total number of ways of selecting the members = 4410 + 1764 + 252 + 9 = 6435 ways

Hence, option C is correct.

6.
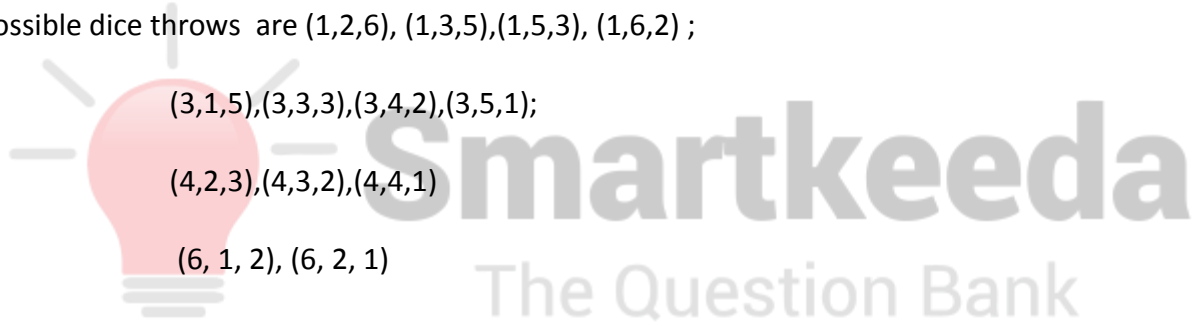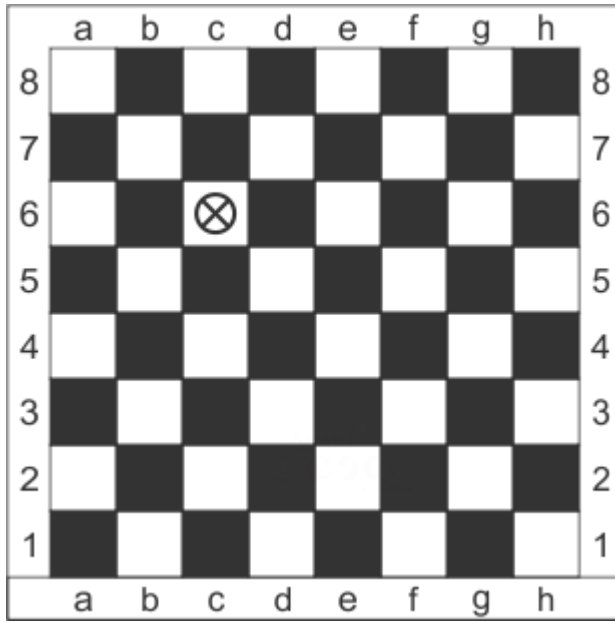
As shows in the image a knight and a rook has to be placed, but not in the same row or column.

Let us select any box out of 64 for placing knight, no of ways = $^{64}C_1$
Now, row 6 and column c can't be used to place rook. Remaining boxes = 64 − (8 + 7) = 49
The rook can be place in any of 49 boxes, no of ways = $^{49}C_1$

Total number of possible ways = $^{49}C_1 \times {}^{64}C_1$ = 3136

Hence, option B is correct.

7.   There are a total of 15 students who are available for selection and Mukesh has to select 5 from these 15. Hence, the total number of ways in which this can be done will be

$$^{15}C_5 = \frac{15 \times 14 \times 13 \times 12 \times 11}{5 \times 4 \times 3 \times 2} = 3003$$

However, this includes all possible cases. We have to select the total number of cases where there is at least 1 girl in the team.

So we can do

Cases with at least 1 girl = Total cases − Cases where there is no girl in the team.
Cases when no girl is selected in the team = $^7C_5$ (The team must be selected from the boys only)

$^7C_5 = 21$

Hence, the required number of cases = 3003 − 21 = 2982
Therefore, option A is correct.

8. The Chocos packets can arranged among themselves in 6! ways, the Biscuit packet in 4! ways and Namkeen packet in 2! ways and there are three groups which can be arranged in 3! ways.

∴ Reqd. number of arrangements = 6! 4! 2! 3! = 720 × 24 × 2 × 6 = 207360

Hence, option B is correct.

9. If three people do not want to sit next to each other, they will occupy alternate chairs, i.e. the first, third and fifth chairs. They can be arranged on these 3 chairs in 3! Ways.

The remaining two people can be arranged on the second and the fourth chairs in 2! Ways.

∴ The total number of arrangements = 3! × 2! = 12

Hence, option C is correct.

10. First we select 8 people out of 10 , no of ways = $^{10}C_8$

Now, out of the selected 8 people we first seat one person on any of the two chairs of any one side, no of ways = 2

Now rest of the seats can be filed in 7! Ways

Total number of ways = $^{10}C_8 × 2 × 7! = \dfrac{10!}{8}$

Hence, option E is correct.

11.

Combinations of three different letter	Number of combinations	Number of permutations for each combination	Total number of permutations
3 different letter	$^8C_3 = 56$	6	336
2 same letter (eg. c.c.v)	$^7C_1 = 7$	3	21
Total			357

Hence, option D is correct.

12. Let the students be S1,S2,S3,S4,S5,S6 and

A ,B and C be three types of toffee

S1 can get any of the 3 from A, B, and C in 3 ways

S2 can get any of the 2, other than what A got in 2 ways

S3,S4,S5,S6 each can get different toffee in 2 ways

Total numbers of ways in which distribution can be done

3 × 2 × 2 × 2 × 2 × 2 = 96

Hence, option C is correct.

13. In the word "Thoughts", there are 2 vowels O and U and 6 consonants, 2T's, 2H, 1G and 1S.

Number of ways = $\dfrac{7! \times 2!}{2! \times 2!}$

→ 35 × 9 × 8 = 2520 ways.

Hence, option C is correct.

14. Any question can be answered in 2 ways (right or wrong)

Let the number of questions be N

$2^N - 1 = 127$

Therefore N = 7

Number of ways in answering 4 answers correctly = $^7c_4$ = 35

Hence, option B is correct.

15. Each letter can be delivered at the six different addresses in 2 different ways

Hence, the required number of ways = 2^6 = 64

Hence, option C is correct.
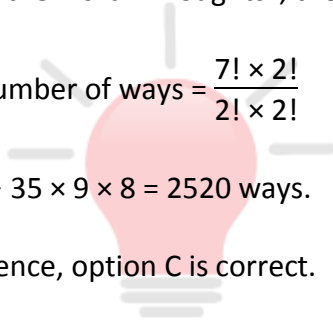
16. Each student is eligible for any number of books then let the number of books = x
Therefore, $2^x = 1024$
x = 10 = The number of books the class teacher has.
Hence, option C is correct.

17. The total number of candidates = 100
For one job opening, any of the candidates can be selected
The required number of ways = $^{100}C_1$ = 100 ways
Hence, option E is correct.

18. The group A can be formed in,
$^{15}C_7$ ways = $\dfrac{15!}{(7! \times 8!)}$ = 6435 ways

Group B can be formed in $^{15}C_8$ ways = $\dfrac{15!}{(8! \times 7!)}$ = 6435 ways

The required number of ways = 6435 + 6435 = 12870 ways
Hence, option A is correct.

19. The total number of ways = $^5C_5 \times {}^5C_3$ = 5 × 2 = 10 ways
Hence, option A is correct.

20. Surely 3 can occur at either hundreds place or tens place or units place. So three cases arise.

a) If 3 occurs at hundredths place then the digit at tens place can be chosen in only nine ways (all ten digits leaving only 3 so we are left with 9 digits) and digit at units place can be chosen in only 8 ways (as 3 and digit at tens place cannot be used again)

So total such numbers = 1 × 9 × 8 = 72

b) If 3 occurs at tens place then its hundreds place can be only chosen in only 8 ways (because use of 3 is not allowed and if we use 0 out of the remaining 9 digits it will be a 2-digit number which is not allowed) and unit place can be chosen only in 8 ways (since digit at hundredths place and 3 is not allowed)

So total such numbers = 8 × 1 × 8 = 64

c) If 3 occurs at units place then its hundreds place can be chosen in only 8 ways (because use of 3 is not allowed and if we use 0 out of the remaining 9 digits it will be a 2-digit number which is not allowed) and tens place can be chosen only in 8 ways (since digit at hundredths place and 3 is not allowed)

So total such numbers = 8 × 8 × 1 = 64
Hence total such numbers = 72 + 64 + 64 = 200

Hence, option B is correct.

21. Let the total number of persons be N.
Given, total number of hand-shakes is 66
For a hand shake we require two people, total number of handshake is $^{N}C_2$

$\therefore {}^{N}C_2 = 66$
$\therefore N(N - 1) / 2 = 66$
$\Rightarrow N^2 - N = 132$
$\Rightarrow N^2 - N - 132 = 0$
$\Rightarrow (N - 12)(N + 11) = 0$
$\Rightarrow N = 12$ persons

Hence option D is correct.

22. **Method I:**
Tulip + Rose + Marigold + Lily

Now six flowers are to be picked from four different types, and we can pick any number of flowers of any type

So, we have to make four divisions of six elements,

For that first we add three elements and arrange them in linear order as shown below

Now there are nine elements, if we mark any three out of these, six elements will remain and these six will be divided in four divisions.

The marked are black and the divisions thus made, are the types of flowers that will be selected from each type.

The number of ways to make division is equal to the number of ways to select three elements from these Nine.

Which is equal to $^{9}C_3 = 84$

Method II:
Tulip + Rose + Marigold + Lily = 10
Person got each of them at least one
Therefore, he has to choose remaining 6 flowers now
Tulip + Rose + Marigold + Lily = 6
Which is equivalent to distribution of 6 items among 4 persons where any person can any number of items = $^{9}C_3 = 84$
Hence, option A is correct.

23. There are 20 families total comprising five members in each family.

Total number of persons in an event = 20 × 5 = 100

Now every member of family will exchange the card with 95 other persons.

Total number of cards exchanged = 100 × 95 = 9500

As two persons exchange two cards with each other, the total number of card exchanges is half the number of cards

So, total number of card exchanges = 9500/2 = 4750

Hence, option E is correct.

24. Case I: Two female players are there in the team
Number of ways to select the team = $^8C_4 \times {}^7C_2$ = 70 × 21 = 1470

Case II: Only one female player is there in the team
Number of ways to select the team = $^8C_5 \times {}^7C_1$ = 7 × 56 = 392

Case III: No female players is there in the team
Number of ways to select the team = $^8C_6$ = 28

So, total number of ways = (1470 + 392 + 28) = 1890

Hence, option D is correct

25. Number of ways to select the team having exactly two female players = $^9C_4 \times {}^xC_2$ = 1890

$$126 \times \left\{ \frac{x\,(x-1)}{2} \right\} = 1890$$

$x^2 - x = 30$
$x^2 - x - 30 = 0$
$x^2 - 6x + 5x - 30 = 0$
$x\,(x - 6) + 5\,(x - 6) = 0$
$(x + 5)\,(x - 6) = 0$
$x = 6, -5$

Number of players can't be negative, so the value of x = 6

Hence, option A is correct.

26. There are three possible cases

Case 1: 3 English + 2 Hindi – No of ways = $^5C_3 \times ^4C_2 = 60$

Case 2: 2 English + 3 Hindi – No of ways = $^5C_2 \times ^4C_3 = 40$

Case 3: 2 English + 2 Hindi + 1 regional – No of ways = $^5C_2 \times ^4C_2 \times ^3C_1 = 180$

Total number of ways = (60 + 40 + 180) = 280

Hence, option D is correct.

27. There are a total of 10 letters - vowels = 4(E = 3, I = 1), consonants = 6 (T = 2, X = C = M = N = 1)

$$\frac{V}{1} \ \frac{\ }{2} \ \frac{\ }{3} \ \frac{V}{4} \ \frac{\ }{5} \ \frac{\ }{6} \ \frac{V}{7} \ \frac{\ }{8} \ \frac{\ }{9} \ \frac{V}{10}$$

If we put a vowel at 1st place the minimum distance to put second vowel is 4 (distance = 3), and the next at 7 and the next at 10, the distance between any two vowels is a multiple of 3.

No other placement of vowels can fulfill this condition.

The number of ways to arrange 4 letters in these 4 places = $\dfrac{4!}{3!} = 4$

The number of ways to arrange the remaining 6 consonants = $\dfrac{6!}{2!}$

Total number of arrangements = $4 \times \dfrac{6!}{2!} = 1440$

Hence, option C is correct.

28. Number of burgers = 5, Fries = 2, cold drink = 3 and dessert = 5

No of possibilities

Item	Varun	Alia	Total	Total
Burgers	$^5C_2$	$^3C_2$	$^5C_2 \times ^3C_2$	30
French Fries	2	2	2 × 2	4
Cold Drinks	3	3	3 × 3	9
Dessert	5	1	5 × 1	5

Total number of possibilities = 30 × 4 × 9 × 5 = 5400

Hence, option B is correct.

29. There are a total of 8 boys and 4 girls

Let G1, G2, G3 and G4 be the girls, in which G2 and G3 want to join niti's team only.

Team	Shaan	Niti	Mika
Case I	G1/G4	G2, G3	G4/G1
Case II	G4/G1	G2, G3, G1/G4	
		G2, G3, G1/G4	G4/G1

Case I :

G1 and G4 are divided into teams of Shaan and Mika.

No of ways to divide girls = 2

Now, out of 8 boys any three can join shaan's team, no of ways to select = $^8C_3$ = 56

And then out of the remaining 5 any three can join Mika's team, so no of ways to select = $^5C_3$ = 10

And the rest two will join Niti's team

Total number of ways to divide boys = 56 × 10 = 560

Total number of ways of divide all participants = 2 × 560 = 1120

Case II:

Any one girl out of G1 and G4 joins Niti's Team then the other one can join Shaan or Mika's Team.

So the no of ways to divide girls = 2 × 2 = 4

(Let's say G1 joins Niti's team and G4 joins Shaan's team)

Now, out of 8 boys any three can join shaan's team, no of ways = $^8C_3$ = 56

And then out of the remaining 5 any four can join Mika's team, so no of ways = $^5C_4$ = 5

And the remaining one will join Niti's team

So, the total number of ways to divide all participants = 4 × 56 × 5 = 1120

Total ways = 2 × 1120 = 2240

Hence, option C is correct.

30. Total students = 6, 4 boys and 2 girls.

There will be two cases

Students sitting in last row	Ways to seat girls	Ways to seat boys
Case I: Only two girls	3×2	$^6C_4 \times 4!$
Case II: Two girls and 1 boy	$3!$	$^6C_3 \times 3!$

Case I: only two girls in last row, number of ways to seat two girls on three seats = 3×2

Now, 4 boys are to be seated on 4 seats out of six seats

Number of ways = $^6C_4 \times 4!$

Total ways = $3 \times 2 \times {}^6C_4 \times 4! = 2160$

Case II: Two girls and one boy in last row, number of ways to select one boy out of 4 = $^4C_1$

Number of ways to arrange two girls and one boy in last row = $3!$

Now, 3 boys are to be seated on 3 seats out of 6 seats

Number of ways = $^6C_3 \times 3!$

Total ways = $^4C_1 \times 3! \times {}^6C_3 \times 3! = 2880$

Total ways = (2160 + 2880) = 5040

Hence, option B is correct.

31. Total number of ways in which 2 notes can be taken from the pocket containing 13 notes is $^{13}C_2$ and the number of ways in which 2 hundred rupee notes can be taken is $^4C_2$.

The probability of choosing 2 hundred rupee notes = $\dfrac{^4C_2}{^{13}C_2}$

$= \dfrac{4 \times 3}{13 \times 12} = 1/13$

Odds in favour of an event = Number of favorable outcomes : Number of unfavorable outcomes

∴ The odds in favour of both the notes being hundred rupee notes are 1 : 12

Hence, option D is correct.

32.

Number of arrangements = $\dfrac{n!}{r!}$

Where n = total number and r = number of letters who is repeated.

Total letters = 6, but A has come twice

So, required number of arrangements

$= \dfrac{6!}{2!} = \dfrac{6 \times 5 \times 4 \times 3 \times 2}{2!} = 6 \times 5 \times 4 \times 3 = 360$

Hence, option A is correct.

33.

Total number of vowel = 3

Total number of consonants = 4

Three vowels can be arranged among themselves in 3! Ways.

P, T, N, T and (AIE) can be arranged in 5!/2! Ways.

Reqd. number of ways = $\dfrac{5!}{2!} \times 3! = 360$

Hence, option (C) is correct.

34. The number of letters in the word OPTICAL is seven, in which three vowels (AIO) are considered as one.

∴   No. of ways 4 letters (PTCL) and group of three vowels which are considered as one letter can be arranged = 5!

and the no. of ways 3 vowels (AIO) can be arranged = 3!

∴   Total no. of ways = 5! × 3! = 720

Hence, option D is correct.

35. Number of consonants = 4

Consonants can be arranged among themselves in 4! Ways.

E, U, A, I, O and (DCTN) can be arranged in 6! Ways

Required number of ways = 6! × 4! = 720 × 24 = 17280

Hence, option (C) is correct.

36. Vowels are : A, I, A and E.

Vowels can be arranged among themselves in
$\frac{4!}{2!}$ ways.

M, R, R, G and (AIAE) can be arranged in =
$\frac{5!}{2!}$ ways.

Total number of ways = $\frac{5!}{2!} \times \frac{4!}{2!}$

= 60 × 12 = 720

Hence, option (A) is correct.

37. Six letter words with at least two vowels can have 2, 3, 4 or 5 vowels as no letters can be repeated.

There are 21 consonants and 5 vowels.

All possible cases:

2 vowels and 4 consonants

3 vowels and 3 consonants

4 vowels and 2 consonants

5 vowels and 1 consonant

∴ Number of ways in which this can be done = $^5C_2 \times {}^{21}C_4 + {}^5C_3 \times {}^{21}C_3 + {}^5C_4 \times {}^{21}C_2 + {}^5C_5 \times {}^{21}C_1$

= 10 × 5985 + 10 × 1330 + 5 × 210 + 1 × 21 = 74221

In each of these cases, chosen 6 letters can arrange themselves in 6! Ways.

∴ Total number of ways in which this can be done = 6! × 74221 = 720 × 74221 = 53439120
Hence, option B is correct.

38. Let the number of men be x and women be y

In badminton two person can play at a time,

Therefore, no of games played between men is $^xC_2 = 36$

$$\frac{x\,(x-1)}{2} = 36$$

$x\,(x-1) = 72$
$x = 9$

Which means total number of men playing badminton are 9

Now, no of games played between women is $^yC_2 = 78$

$$\frac{y\,(y-1)}{2} = 78$$

$y\,(y-1) = 156$

$y = 13$

Which means total number of women playing badminton are 13

Therefore, no of games in which one player is man and one is woman is,

$^9C_1 \times ^{13}C_1 = 117$

Hence, option (B) is correct.

39. From the word 'ALLAHABAD'-

Total cases = 'ALL', 'LLA', 'LAH', 'AHA', 'HAB', 'ABA' and 'BAD'

Required cases = 'ALL', 'LLA', 'AHA' and 'ABA'

Total required cases = 4

From the word 'BANGALORE'-

Total cases = 'BA', 'AN', 'NG', 'GA', 'AL', 'LO', 'OR' and 'RE'

Required cases = 'BA', 'AN', 'GA', 'AL', 'LO', 'OR' and 'RE'

Total required cases = 7

Difference = 7 – 4 = 3
Hence, option (B) is correct.

40. Total letters = 6 (U, G, 2 A, N, D)

When G always comes at first place and N always comes at last place so we have 4 letters to arrange which can be arranged in 4! Ways. 'A' appears twice in the remaining 4 letters.

So, required number of ways = $\dfrac{4!}{2!}$ = 12

Hence, option C is correct.

41. Case I: 4 consonants and 1 vowel is there in the word

Number of ways = $^4C_4 \times {}^5C_1 = 1 \times 5 = 5$

Case II: 3 consonants and 2 vowels is there in the word

Number of ways = $^4C_3 \times {}^5C_2 = 4 \times 10 = 40$

So, total number of ways = 40 + 5 = 45

So option C is the correct answer.

42. Case I: Two male members in the committee
Number of ways to select the committee = $^{12}C_2 \times {}^{10}C_6 = 66 \times 210 = 13860$ ways

Case II: One male member in the committee
Number of ways to select the committee = $^{12}C_1 \times {}^{10}C_7 = 12 \times 120 = 1440$ ways

So, total number of ways = 13860 + 1440 = 15300 ways

Hence, option C is correct.

43. According to the given problem,

Total number of males = 8
Total number of females = 8

We need to select a team of 4 persons with atleast one female.

The possible combinations for a group of four person are :- 1 female and 3 males, 2 females and 2 males, 3 females and 1 male, 4 females and 0 male.

Therefore, ways in which selection can be made are = $^8C_1 \times {}^8C_3 + {}^8C_2 \times {}^8C_2 + {}^8C_3 \times {}^8C_1 + {}^8C_4 \times {}^8C_0$
= 448 + 784 + 448 + 70 = 1750

The important thing to note is that there should be at least 1 female in the group and at most 4 females can be there in the group of 4 persons.
Hence, option (C) is correct.

44. Let the husbands be h1, h2, h3.......h9 and wives be w1, w2, w3.......w9

Choosing 2 husband=$^9C_2$=36

Choosing 2 wives = $^7C_2$ =21 (Here we should have taken $^9C_2$, but as per the question no husband and wife can play in the same game, so we eliminated 2 wives of chosen husbands)

We know that in mixed double game, it is played as m1w1 vs m2w2.

So, out of 36 men and 21 women two arrangement is possible, either m1w1 vs m2w2 or m2w1 vs m1w2.

Therefore, total ways = 36 × 21 × 2 = 1512 ways

Hence, option (C) is correct.

45. Number of ways in which the basketball team is selected = $^{10}C_3 \times {}^8C_2$ = 120 × 28 = 3360

Number of ways in which the volleyball team is selected = $^8C_4 \times {}^7C_2$ = 70 × 21 = 1470

Required difference = 3360 – 1470 = 1890

Hence, option A is correct.

46. The given word has six letters A – 2, P -1, E – 1, C – 1 and M – 1

There are three cases,

Case 1: Both As are selected
Selection = selecting 2 letters out of remaining 4 = $^4C_2$

Arrangement = 4!/2!
Words possible = $^4C_2 \times$ 4!/2! = 72

Case 2: Only one A is selected
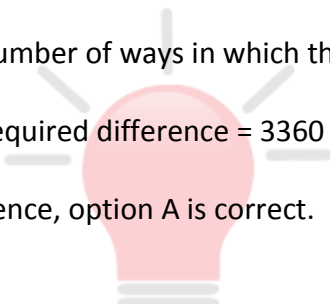Selection of three letters from remaining four letters = $^4C_3$

Arrangement = 4!
Words possible = $^4C_3 \times$ 4! = 96

Case 3: No A is selected
Arrangement = 4! = 24

Total words possible = 72 + 96 + 24 = 192
Hence, option E is correct.

47. C will sit on 1 and B will sit somewhere to the right of A

<u>　1　</u>　<u>　2　</u>　<u>　3　</u>　<u>　4　</u>　<u>　5　</u>

C will sit on 1

Then there are three possibilities

Case 1: A on 2, so B can be seated on 3, 4 or 5

Then remaining two can be seated on two chairs in 2 ways

Ways = 3 × 2 = 6

Case 2: A on 3, so B can be seated on 4 or 5

Ways = 2 × 2 = 4

Case 3: A on 4, so B will be on 5

Ways = 2

Total ways to they can sit = (6 + 4 + 2) = 12

Hence, option D is correct.

48. Two girls will always be together

So first we select one row to seat these two girls, ways = 2

Now we can select two adjacent chairs in 4 ways and then girls can sit on them in 2 ways

Ways to seat these two girls = 2 × 4 × 2 = 16

All the girls should not be together, so at least one girl should be in another row from the remaining two girls.

So from the remaining two girls we select one to be seated in second row, ways = 2

Now in the second row we select one chair out of five to seat the selected girl, ways = 5

Ways to seat third girl = 2 × 5 = 10

Now rest of the seven can be arranged in 7! Ways

Total ways = 16 × 10 × 7! = 20 × 8!

Hence, option B is correct.

49. There are three sets of chairs facing each other, we select one set, ways = 3

Now the girls can be seated on these two in 2! Ways

4 boys can be seated on the remaining four chairs in 4! Ways

Total ways = 3 × 2 × 4! = 144

Hence, option C is correct.

50. U, N, R, O, G, E and D (2 times)

For first and last letter to be same

First and last letter should be D

D __ __ __ __ __ __ D

__ N __ R __ G __

Now in the middle six letters no two vowels should be together

So first we arrange three consonants, ways = 3!

Now from the four available spaces we select three places and then arrange the three vowels there.

Ways = $^4C_3$ × 3!

Total ways = 3! × $^4C_3$ × 3! = 144

Hence, option D is correct.