Additional Problems For Self Practice (APSP)

PART - I : PRACTICE TEST PAPER

This Section is not meant for classroom discussion. It is being given to promote self-study and self testing amongst the Resonance students.

Max. Marks : 120 **Max. Time : 1 Hr.**

Important Instructions :

1. The test is of **1 hour** duration and max. marks 120.
2. The test consists **30** questions, **4 marks** each.
3. Only one choice is correct **1 mark** will be deducted for incorrect response. No deduction from the total score will be made if no response is indicated for an item in the answer sheet.
4. There is only one correct response for each question. Filling up more than one response in any question will be treated as wrong response and marks for wrong response will be deducted accordingly as per instructions 3 above.

1. If Johnson has 4 formal shirts with different colours and 5 formal trousers with different colours then in how many ways he can wear his dress in different colour.
(1) 9 (2) 20 (3) $^5C_4$ (4) 4^5

2. If the sum of factorials of consecutive 'k' natural number is a three digit number then maximum value of k is
(1) 3 (2) 4 (3) 5 (4) 6

3. In how many ways can Mr. X call 4 friends out of his 10 friends for dinner
(1) 210 (2) 250 (3) 180 (4) None of these

4. In how many ways 11 players can be selected out of 20 players if Virat and Dhoni are always selected but Yuvi & Dinesh always rejected.
(1) $^{18}C_{11}$ (2) $^{16}C_9$ (3) $^{19}C_{10}$ (4) $^{20}C_9$

5. In an examination a student has to write 6 papers and has to pass in each paper to pass the exam. In how many ways a student can fail in the exam ?
(1) 31 (2) 64 (3) 63 (4) 32

6. A work can be completed by 3 men or 5 women in 5 days. In how many ways workforce can be selected if work has to be finished in 5 days and available workforce is 10 men and 8 women. If workforce has either only men or only women.
(1) 240 (2) 220 (3) 210 (4) None of these

7. In a party 10 students gave gift to each other then the total number of gifts distributed are
(1) $^{10}C_2$ (2) $2.^{10}C_2$ (3) $\frac{(^{10}C_2)}{2}$ (4) 10^2

8. How many distinct lines can be drawn through 8 points , 4 of which are on a straight line and remaining 4 are on other straight line which is parallel to the 1st straight line
(1) 23 (2) 24 (3) 18 (4) 16

9. Consider a square along with its 2 diagonals , how many triangles are formed by this system
(1) 6 (2) 9 (3) 8 (4) 10

10. A polygon has 54 diagonals then its number of sides are -
(1) 12 (2) 10 (3) 11 (4) 13

11. In how many ways 10 identical objects can be arranged in a straight line

(1) 10 ! (2) $\frac{10!}{2}$ (3) 10 (4) $^{10}C_{10}$

12. In how many ways can 7 students be arranged on 10 chairs in a row.

(1) $^{10}P_7$ (2) 7! (3) $^{10}C_7$ (4) $\frac{10!}{7!}$

13. In how many ways 20 person be arrange in a voting line if person A, wants to vote before person B

(1) 20 ! (2) 18 ! × 2 (3) 19! (4) 10(19!)

14. In how many ways batting order of 11 players can be made out of 15 players of 2 players can play only as wicket keeper and there is exactly one wicket keeper in the sequence.

(1) (11!) ($^2C_1 \times {}^{13}C_{10}$) (2) (11!) ($^2C_1 \times {}^{14}C_{11}$) (3) (11!) ($^2C_1 + {}^{13}C_{10}$) (4) None of these

15. In how many ways 6 person can be seated around a circular table if person A and B always sit in front of each other

(1) 120 (2) 60 (3) 24 (4) 720

16. In how many ways 5 boys & 4 girls can sit around a circular table having 9 chairs numbered from 1 to 9.

(1) 5 ! × 4! (2) 9! (3) 4! × 4! (4) $\frac{9!}{2}$

17. In how many ways a host and 10 guest can sit around a circular table having 1 wooden and 10 fiber identical chairs if host wants to sit on wooden chair.

(1) 10! (2) 11! (3) 2(10!) (4) $\frac{(11!)}{2}$

18. Find the number of ways in which 15 same colored identical beads can be arranged to form a necklace

(1) 14! (2) $\frac{(14!)}{2}$ (3) $\frac{15!}{2}$ (4) None of these

19. How many words can be formed from all letters of the word "SOCIETY" without repetition.

(1) (7!) × $\frac{1}{2}$ (2) 6! (3) 7(6!) (4) 5(6!)

20. How many words can be formed from all the letters of the word "CREATIVITY" not starting with c

(1) $\frac{10!}{2!2!}$ (2) $\frac{9!}{2!2!}$ (3) $\frac{9(9!)}{2!2!}$ (4) None of these

21. How many three digit numbers greater than 300 can be formed from the digits 0, 1, 2, 3, 4, & 5 without repetition.

(1) 60 (2) 120 (3) 80 (4) 100

22. How many 4 digit even numbers can be formed from the digits 0, 1, 2, 4, 3, 7, 9 without repetition

(1) 360 (2) 320 (3) 120 (4) 200

23. If all the words from all the letters of the word "CIRCLE" are arranged according to dictionary format then find the rank of the word "CIRCLE" in it

(1) 66 (2) 67 (3) 68 (4) 69

24. In how many ways 5 distinct rings can be worn on 4 fingers if any number of rings can be wear on any finger (arrangement of rings on finger are not to be considered)

(1) $^5C_4 \times 4!$ (2) 4^5 (3) 5^4 (4) 5!

25. In how many ways 20 identical chocolates be distributed among 5 students with no restriction

(1) $^{24}C_4$ (2) 5^{20} (3) 20^5 (4) $^{25}C_5$

26. In how many ways a Father can distribute 15 distinct toys equally among his 3 childrens ?

(1) $^{15}C_3 \times 3!$ (2) $\frac{15!}{3!(5!)^3}$ (3) $\frac{15!}{(5!)^3}$ (4) $\frac{15!}{3(5!)^3}$

27. Find the number of non-negative integral solutions of equation x + y + z + w = 10

(1) $^{14}C_4$ (2) $^{13}C_3$ (3) 4^{10} (4) 10^4

28. How many ways can we put 4 different letters in 4 different addressed envelopes if no letter goes to correct envelope except one

(1) 24 (2) 8 (3) 6 (4) 9

29. In how many ways atleast one fruit be selected out of 5 mangoes, 4 oranges and 6 Apples if one Mango, two oranges and one apple is always there in selection

(1) 60 (2) 120 (3) 90 (4) 119

30. Find total number of divisors of 1000

(1) 9 (2) 10 (3) 15 (4) 16

Practice Test (JEE-Main Pattern)
OBJECTIVE RESPONSE SHEET (ORS)

Que.	1	2	3	4	5	6	7	8	9	10
Ans.										
Que.	11	12	13	14	15	16	17	18	19	20
Ans.										
Que.	21	22	23	24	25	26	27	28	29	30
Ans.										

PART - II : PRACTICE QUESTIONS

1. Let S = {1, 2, 3, 4}, Then total number of unordered pairs of disjoint subsets of S is equal to

(1) 25 (2) 34 (3) 42 (4) 41

2. If total number of runs scored in n matches is $\left(\frac{n+1}{4}\right)$ $(2^{n+1} - n - 2)$ where n > 1 and the runs scored in the k^{th} match are given by $k.\ 2^{n+1-k}$, where $1 \le k \le n$, then the value of n is

(1)5 (2) 6 (3) 3 (4) 7

3. Number of different squares of any size (side of square be natural no.) which can be made from a rectangle of size 15 × 8, is -

(1) 456 (2) 120 (3) 228 (4) None of these

4. Number of natural number upto one lakh, which contains 1,2,3, exactly once and remaining digits any time is -

(1) 2940 (2) 2850 (3) 2775 (4) 2680

5. Given six line segments of length 2, 3, 4, 5, 6, 7 units, the number of triangles that can be formed by these segments is

(1) $^6C_3 - 7$ (2) $^6C_3 - 6$ (3) $^6C_3 - 5$ (4) $^6C_3 - 4$

6. A five letter word is to be formed such that the letters appearing in the odd numbered positions are taken from the letters which appear without repetition in the word "MATHEMATICS". Further the letters appearing in the even numbered positions are taken from the letters which appear with repetition in the same word "MATHEMATICS". The number of ways in which the five letter word can be formed is:
(1) 720 (2) 540 (3) 360 (4) none

7. A family consists of a grandfather, m sons and daughters and 2n grand children. They are to be seated in a row for dinner. The grand children wish to occupy the n seats at each end and the grandfather refuses to have a grand children on either side of him. In how many ways can the family be made to sit ?
(1) $(2n)!\, m!\, (m-1)$ (2) $(2n)!\, m!\, (m+1)$ (3) $(n)!\, m!\, (m-1)$ (4) $(2n)!\, (m!)^2$

8. Number of words that can be formed using the letters of the word "HONOLULU" in which consonants & vowels are alternate is
(1) 840 (2) 144 (3) 900 (4) 26

9. Number of words that can be formed using the letters of the word "HONOLULU", without changing the order of vowels is -
(1) 840 (2) 144 (3) 900 (4) 26

10. Number of words that can be formed using the letters of the word "HONOLULU", in which two O's are together but U's are separated is
(1) 840 (2) 144 (3) 900 (4) 26

11. Number of ways in which all the letters of the word " ALASKA " can be arranged in a circle distinguishing between the clockwise and anticlockwise arrangement,,is :
(1) 60 (2) 40 (3) 20 (4) none of these

12. The sum of all 4 digit numbers that can be formed by using the digits 2,4,6,8 (repetition of digits not allowed) is
(1) 133320 (2) 533280 (3) 53328 (4) None of these

COMPREHENSION

Comprehension # 1 (Q.13 to 14)

Let a_n denote the number of all n-digit positive integers formed by the digits 0,1 or both such that no consecutive digits in them are 0. Let b_n = the number of such n-digit integers ending with digit 1 and c_n = the number of such n-digit integers ending with digit 0.

13. Which of the following is correct ?
(1) $a_{17} = a_{16} + a_{15}$ (2) $c_{17} \neq c_{16} + c_{15}$ (3) $b_{17} \neq b_{16} + c_{16}$ (4) $a_{17} = c_{17} + b_{16}$

14. The value of b_6 is
(1) 7 (2) 8 (3) 9 (4) 11

Comprehension # 2(Q. No. 15 to 17)

There are 8 official and 4 non-official members, out of these 12 members a committee of 5 members is to be formed, then answer the following questions.

15. Number of committees consisting of 3 official and 2 non-official members, are
(1) 363 (2) 336 (3) 236 (4) 326

16. Number of committees consisting of at least two non-official members, are
(1) 456 (2) 546 (3) 654 (4) 466

17. Number of committees in which a particular official member is never included, are

(1) 264 (2) 642 (3) 266 (4) 462

Comprehenssion # 3 (Q. No. 18 to 20)

Let n be the number of ways in which the letters of the word "RESONANCE" can be arranged so that vowels appear at the even places and m be the number of ways in which "RESONANCE" can be arrange so that letters R, S, O, A, appear in the order same as in the word RESONANCE, then answer the following questions.

18. The value of n is
(1) 360 (2) 720 (3) 240 (4) 840

19. The value of m is
(1) 3780 (2) 3870 (3) 3670 (4) 3760

20. The exponent of 5 in n! is
(1) 88 (2) 178 (3) 358 (4) None of these

ASSERTION / REASONING

DIRECTIONS :

Each question has 4 choices (1), (2), (3) and (4) out of which ONLY ONE is correct.

(1) Both the statements are true. (2) Statement-I is true, but Statement-II is false.
(3) Statement-I is false, but Statement-II is true. (4) Both the statements are false.

21. **Statement-I :** $\frac{(n^2)!}{(n!)^n}$ is an integer ($n \in I^+$).

Statement-II : Number of ways to divide m + n distinct objects into two groups of sizes m and n is $\frac{(m+n)!}{m!\,n!}$

APSP Answers

PART - I

1.	(2)	**2.**	(4)	**3.**	(1)	**4.**	(2)	**5.**	(3)	**6.**	(4)	**7.**	(2)
8.	(3)	**9.**	(3)	**10.**	(1)	**11.**	(4)	**12.**	(1)	**13.**	(4)	**14.**	(1)
15.	(3)	**16.**	(2)	**17.**	(1)	**18.**	(4)	**19.**	(3)	**20.**	(3)	**21.**	(1)
22.	(2)	**23.**	(3)	**24.**	(2)	**25.**	(1)	**26.**	(3)	**27.**	(2)	**28.**	(2)
29.	(3)	**30.**	(4)										

PART - II

1.	(4)	**2.**	(4)	**3.**	(1)	**4.**	(1)	**5.**	(1)	**6.**	(2)	**7.**	(1)
8.	(2)	**9.**	(1)	**10.**	(3)	**11.**	(3)	**12.**	(1)	**13.**	(1)	**14.**	(2)
15.	(2)	**16.**	(1)	**17.**	(4)	**18.**	(2)	**19.**	(1)	**20.**	(2)	**21.**	(1)