ABHIMANYU BATCH
MATHEMATICS : REVISION TEST-2 (SET B)
Topic: Complex Number + PnC + Probability

1. $\dfrac{8!}{2(6!)} =$

    (a)   28   (b)   56   (c)   42   (d)   38

2. $\dfrac{1}{5!} + \dfrac{1}{6!} =$

    (a) $\dfrac{7!}{720}$ (b) $\dfrac{7}{720}$ (c) $\dfrac{7}{120}$ (d) $\dfrac{7!}{120}$

3. In a class there are 10 boys and 8 girls. The teacher wants to select either a boy or a girl to represent the class in a function. In how many ways the teacher can make this selection?

    (a)   18   (b)   80   (c) 8^{10} (d) 10^8

4. How many committees of 5 members can be formed from 6 gentlemen and 4 ladies?

    (a)   4950   (b)   4590   (c)   3950   (d)   3590

5. There are 15 persons in a party and each person shakes hand with another, then total number of hand shakes is

    (a) $^{15}P_2$ (b) $^{15}C_2$ (c)   15!   (d)   2(15!)

6. A person has 15 friends of whom 10 are relatives. In how many ways can he invite 12 guests such that 8 of them are relative?

    (a)   225   (b)   150   (c)   175   (d)   250

7. In how many ways can 10 balls be divided between two boys, one receiving two and the other eight balls

    (a)   45   (b)   75   (c)   90   (d)   None of these

8. $\dfrac{4(45!) + 46!}{150(44!)} =$

    (a)   15   (b)   25   (c)   18   (d)   28

Space for Rough Work

9. If $^nP_5 = 60 \times {}^{n-1}P_3$, then n is =

(a) 6   (b) 15   (c) 10   (d) 12

10. There are four bus routes between A and B and three bus routes between B and C. In how many ways can a man travel by bus from A to C via B?

(a) 12   (b) 7   (c) 9   (d) 16

11. Two coins are tossed. What is the probability of getting 2 heads or 2 tails?

(a) $\dfrac{1}{2}$ (b) $\dfrac{1}{3}$ (c) $\dfrac{1}{4}$ (d) $\dfrac{3}{4}$

12. If two balanced dice are tossed once, the probability of the event, that the sum of the integers coming on the upper sides of the two dice is 9, is

(a) $\dfrac{7}{18}$ (b) $\dfrac{5}{36}$ (c) $\dfrac{1}{9}$ (d) $\dfrac{1}{6}$

13. If $P(A) = 0.4$, $P(B) = x$, $P(A \cup B) = 0.7$ and the events A and B are independent, then x =

(a) $\dfrac{1}{3}$ (b) $\dfrac{1}{2}$ (c) $\dfrac{2}{3}$ (d) None of these

14. If A and B are two events such that $P(A \cup B) + P(A \cap B) = \dfrac{7}{8}$ and $P(A) = 2P(B)$, then $P(A) =$

(a) $\dfrac{7}{12}$ (b) $\dfrac{7}{24}$ (c) $\dfrac{5}{12}$ (d) $\dfrac{17}{24}$

15. For a biased die the probabilities for different faces to turn up are given below:

Face:	1	2	3	4	5	6
Probability:	0.1	0.32	0.21	0.15	0.05	0.17

The die is thrown and you are told that either face 1 or 2 has turned up. Then the probability that it is face 1, is

(a) $\dfrac{5}{21}$ (b) $\dfrac{5}{22}$ (c) $\dfrac{4}{22}$ (d) None of these

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16. Two dice are thrown simultaneously. The probability of obtaining a total score of 5 is

    (a) $\dfrac{1}{9}$ (b) $\dfrac{1}{18}$ (c) $\dfrac{1}{36}$ (d) $\dfrac{1}{12}$

17. If two dice are thrown simultaneously, then the probability that the sum of the numbers which come up on the dice to be more than 5 is

    (a) $\dfrac{5}{18}$ (b) $\dfrac{5}{36}$ (c) $\dfrac{13}{18}$ (d) $\dfrac{1}{6}$

18. Let A and B be two events such that $P(A) = 0.3$ and $P(A \cup B) = 0.8$. If A and B are independent events, then $P(B) =$

    (a) $\dfrac{5}{6}$ (b) $\dfrac{5}{7}$ (c) $\dfrac{3}{5}$ (d) $\dfrac{2}{5}$

19. If two unbiased dice are rolled simultaneously until a sum of the number appeared on these dice is either 7 or 11, then the probability that 7 comes before 11, is

    (a) $\dfrac{3}{8}$ (b) $\dfrac{3}{4}$ (c) $\dfrac{5}{6}$ (d) $\dfrac{2}{9}$

20. The probability that A speaks truth is $\dfrac{4}{5}$, while this probability for B is $\dfrac{3}{5}$. The probability of atleast one of them is true when asked to speak on an event is

    (a) $\dfrac{4}{25}$ (b) $\dfrac{2}{25}$ (c) $\dfrac{3}{25}$ (d) $\dfrac{23}{25}$

21. The conjugate of a complex number z is $\dfrac{1}{i-1}$. Then, the complex number is

    (a) $\dfrac{-1}{i+1}$ (b) $\dfrac{1}{i-1}$ (c) $\dfrac{-1}{i-1}$ (d) $\dfrac{1}{i+1}$

22. If $z_1 = 3 + 2i$ and $z_2 = 2 - 3i$, then $z_1 + z_2 =$
    (a) $7 - i$ (b) $7 + i$ (c) $5 + i$ (d) $5 - i$

Space for Rough Work

23. If $z_1 = 1 - 3i$ and $z_2 = 2 + i$, then $\overline{z}_1 + \overline{z}_2 =$

    (a) $3 - 2i$ (b) $2 + 3i$ (c) $3 + 2i$ (d) $2 - 3i$

24. If z is any complex number, then $\dfrac{z - \overline{z}}{2i} =$

    (a)   purely real   (b)   purely imaginary

    (c)   either 0 or purely imaginary   (d)   none of these

25. $5 + i^{22} + i^{36} + i^{56} =$

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

26. If $z = (3\sqrt{7} + 4i)^2 (3\sqrt{7} - 4i)^3$, then $\text{Re}(z) =$

    (a) $79 \times 3\sqrt{7}$ (b) $(79)^2 3\sqrt{7}$ (c) $-4 (79)^2$ (d) $(79)^2 (3\sqrt{7} - 4i)$

27. For a positive integer n, the expression $(1-i)^n \left(1 - \dfrac{1}{i}\right)^n$ equals

    (a)   0   (b) $2i^n$ (c) 2^n (d) 4^n

28. The value of the sum $\sum_{n=1}^{13} (i^n + i^{n+1})$, where $i = \sqrt{-1}$, equals

    (a) i (b) $i - 1$ (c) $-i$ (d)   0

29. If $\left(\dfrac{1-i}{1+i}\right)^{100} = a + ib$, then

    (a) $a = 2, b = -1$ (b) $a = 1, b = 0$ (c) $a = 0, b = 1$ (d) $a = -1, b = 2$

30. If $i^2 = -1$, then $i + i^2 + i^3 + \ldots$ to 1000 terms is equal to

    (a)   1   (b) -1 (c) i (d)   0

31. In how many ways can a cricket team of eleven select a captain and a vice-captain amongst themselves?

    (a)   21   (b)   121   (c)   110   (d)   22

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32. $^nC_r \div {}^nC_{r-1} =$

(a) $\dfrac{n-r}{r}$ (b) $\dfrac{n+r-1}{r}$ (c) $\dfrac{n-r+1}{r}$ (d) $\dfrac{n-r-1}{r}$

33. If $^{2n}C_3 : {}^nC_2 = 44 : 3$, then for which of the following values of r, the value of ^nC_r will be 15

(a) $r = 3$ (b) $r = 4$ (c) $r = 6$ (d) $r = 5$

34. In how many different ways can four cards be drawn from a well shuffled pack of 52 playing cards so as to contain 2 club cards and 2 spade cards?

(a) 6084   (b) 6048   (c) 4086   (d) 4068

35. The number of all numbers having 5 digits, with distinct digits is

(a) 99999   (b) $9 \times {}^9P_4$ (c) $^{10}P_5$ (d) $^9P_4$

36. In how many ways can the letters of the word 'CABLE' be arranged so that the vowels should always occupy odd places?

(a) 24   (b) 36   (c) 12   (d) 18

37. Let x denote the number of ways of arranging m boys and m girls in a row so that no two boys sit together. If y and z give the number of ways of arranging m boys and m girls in a row and around a circular table respectively so that boys and girls sit alternately, then x : y : z =

(a) $m + 1 : m : m - 1$ (b) $3 : 2 : 1$ (c) $m - 1 : m : 2$ (d) $(m + 1)m : 2m : 1$

38. Everybody in a room shakes hands with everybody else. The total number of handshakes is 45. The total number of persons in the room is

(a) 9   (b) 10   (c) 5   (d) 15

39. A village has 10 players. A team of 6 players is to be formed. 5 members are chosen first out of these 10 players and then the captain is chosen from the remaining players. Then the total number of ways of choosing such team is

(a) 1260   (b) 210   (c) $(^{10}C_6)5!$ (d) $(^{10}C_5)6$

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40. A candidate is required to answer 6 out of 12 questions which are divided into two parts A and B each containing 6 questions and he/she is not permitted to attempt more than 4 questions from any part. In how many different ways can he/she make up his/her choice of 6 questions?

   (a) 850 (b) 800 (c) 750 (d) 700

41. If $z = \dfrac{4}{1-i}$, then $\bar{z}$ is (where $\bar{z}$ is complex conjugate of z)

   (a) $2(1 + i)$ (b) $1 + i$ (c) $\dfrac{2}{1-i}$ (d) $\dfrac{4}{1+i}$

42. If $z_1 = 1 - 2i$, $z_2 = 1 + I$ and $z_3 = 3 + 4i$, then $\left(\dfrac{1}{z_1} + \dfrac{3}{z_2}\right)\dfrac{z_3}{z_2} =$

   (a) $13 - 6i$ (b) $13 - 3i$ (c) $6 - \dfrac{13}{2}i$ (d) $\dfrac{13}{2} - 3i$

43. $(1 + i)^{10}$, where $i^2 = -1$, is equal to

   (a) $32i$ (b) $64 + i$ (c) $24i - 32$ (d) $24i$

44. If $x + iy = (1 + i)^6 - (1 - i)^6$, then which one of the following is true?

   (a) $x + y = 16$ (b) $x + y = -16$ (c) $x + y = -8$ (d) $x + y = 8$

45. If $z = \dfrac{7-i}{3-4i}$, then $z^{14} =$

   (a) 2^7 (b) 2^7i (c) $2^{14}i$ (d) -2^7i

46. The probability of an impossible event is

   (a) 1 (b) 2 (c) $\dfrac{1}{2}$ (d) 3

47. If in a lottery there are 5 prizes and 20 blanks, then the probability of getting a prize is

   (a) $\dfrac{1}{5}$ (b) $\dfrac{2}{5}$ (c) $\dfrac{4}{5}$ (d) None of these

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48.   If $P(A) = \dfrac{1}{4}, P(B) = \dfrac{1}{2}, P(A \cup B) = \dfrac{5}{8},$ then $P(A \cap B)$ is equal to

(a) $\dfrac{3}{8}$ (b) $\dfrac{1}{8}$ (c) $\dfrac{2}{8}$ (d) $\dfrac{5}{8}$

49.   The probabilities of a student getting first class or second class or third class in an examination are $\dfrac{2}{7}, \dfrac{3}{5}, \dfrac{1}{10}$

respectively. The probability that the student fails is

(a) $\dfrac{6}{70}$ (b) $\dfrac{11}{70}$ (c) $\dfrac{3}{35}$ (d) $\dfrac{1}{70}$

50.   A bag X contains 2 white and 3 black balls and another bag Y contains 4 white and 2 black balls. One bag is selected at random and a ball is drawn from it. Then the probability for the balls chosen to be white is

(a) $\dfrac{2}{15}$ (b) $\dfrac{7}{15}$ (c) $\dfrac{8}{15}$ (d) $\dfrac{14}{15}$

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ABHIMANYU BATCH
MATHEMATICS : REVISION TEST-2 (SET B) ANSWER KEY
Topic: Complex Number + PnC + Probability

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