cbse guess http://www.cbseguess.com/

Sample Paper
Class – XI
Subject - Mathematics

Practice Questions for Half-Yearly Examination

1. Write down all possible subsets of{1. ,{1}}

2. Show that, {[(())]}4*nPPP*φ=.

3. For any three sets ,*AB* and*C*, show using Venn diagram, ()()(*ABCABAC*∩−=∩−∩.

4. If and()700,()200,()300*nUnAnB*===()1*nAB*∩=, find(")*nAB*∩.

5. In a survey it was found that 21 people liked product A, 26 liked product B and 29 liked product C. If 14 people liked product A and B, 12 people liked products C and A, 14 people liked product B and C and 8 people liked all the three products. Find how many liked product C only.

6. Find the domain and the range of the real function f defined by()1*fxx*=−.

7. Find the domain and range of₂()9*gxx*=−.

8. Let. Let {1,2,3,4,6}*A*=*R* be the relation of *A* defined by {(,):,,*ababAb*∈is exactly divisible by }*a*

i) Write *R* is roster form.
ii) Find the Domain of *R*
iii) Find the Range of*R*.

9. Find the domain and range of()13*fxx*=−−.

10. Solve, 25,3*xRx*>∈−.

11. Solve this inequality graphically: 210,1,0,0,0*xyxyxyxy*+≤+≥−≤≥≥.

12. Solve graphically:0,0,36,1447,1843,332≥≥≤−≤+−≤+≥+*yxyxyxyxyx*.

13. A manufacturer has 600 litres of a 12% solution of acid. How many litres of a 30% acid solution must be added to it so that acid content in the resulting mixture will be more than 15% but less than 18%?

14. Find the value oftan()8π.

15. Prove that, cotcot2cot2cot3cot3cot1*xxxxxx*−−.

16. Prove that, 22sin6sin4sin2sin10*xxx*−=.

17. Solve, cos. 3coscos20*xxx*+−=

18. If 3tan,42*xx*ππ=<<, find the value of sin,cos22*xx* and tan2*x*.

19. If 1cot2α= and5sec3β−=, where 3(,)2παπ∈ and(,)2πβπ∈, find the value of tan()αβ+.

20. Solve, tantan2tantan21θθθθ++.

21. Prove that, t. an70tan202tan50=+

22. Convert the complex number 133*iZCosiSin*ππ+=− in the polar form.

23. If 2()(2)*aipiqai*+=−−show that, 22222(1)(41)*apqa*++=+,where 1*i*=−.

24. Convert θθsincos1*i*++ in polar form.

25. If , then show that, . ()()()()()12345*iiiiia*+++++=+222.5.10.17.26*ab*=+

26. Solve, 2(322)620*xixi*−++=.

27. Find the slope of the line, which makes an angle with the positive direction of *Y*-axis measured anticlockwise. 30

28. If three points (lie on a line, show that, ,0),(,),(0,)*habk*1*abhk*+=.
29. Find the point(s) on the *x*-axis, whose distances from the line 134*xy*+= are 4 units.

30. If is the length of perpendicular from the origin to the line whose intercepts on the axes are and*b*, then show that, *pa*22111*pab*=+.

31. Assuming that the straight line work as the plane mirror for a point, find the image of the point in the line. (1,2)34*xy*−+=

32. If 1119!10!11!11!*x*++=, then find *x*.

33. For a set of five true/false questions, no student has written all correct answers, and no two students have given the same sequence of answers. What is the maximum number of students in the class for this to be possible?

34. How many numbers greater than 1000, but not greater than 4000 can be formed with the digits 0, 1, 2, 3, 4 if (i) repetition of digits is allowed? (ii) Repetition of digits is not allowed?

35. In how many ways can 5 letters be posted in 4 letter boxes?

36. There are six periods in each working day of a school. In how many ways can one arrange 5 subjects such that each subject is allowed at least one period?

37. A group consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has (i) at least one boy and one girl? (ii) At least 3 girls ?

38. Using method of mathematical induction prove that, 32222123....3*nn*+++>.

39. Using method of mathematical induction prove that, (1)1*nxnx*+≥+, for all natural number , where . *n*1*x*>−

40. Using method of mathematical induction prove that, 2311.22.23.2.....2(1)22*nnnn*+++++=−+.

41. Prove by induction that is divisible by 133 for all natural numbers. 1221211+++*nn*

42. Using method of mathematical induction prove that, 2238*nn*+−− is divisible by 8.

43. Find the term independent of x in the expansion of 1023132*xx*⎛⎞⎜⎟⎝⎠−.

44. If the coefficients of second, third and fourth terms of 2(1)*nx*+ are in A.P. , show that, 2297*nn*−+=

45. If the ratio between the terms of two arithmetic progressions is *n*(71):(427)*nn*++, find the ratio of the 11th terms.

46. Find the sum of all natural numbers lying between 100 and 200, which are multiple of both 2 and 5.

47. If the sum of first *p* terms of an A.P. is the same as the sum of its first terms, show that the sum of first (*qpq*+ terms is zero.

48. If the first and the n[th] terms of a G.P. are *x* and *y* respectively and P is the product of its first n terms then prove that, $_2()_n Pxy=$.

49. If S be the sum, P the product and R the sum of the reciprocals of n terms in a G.P., prove that $_2()_n SPR=$.

Biswa Ranjan Pradhan 3