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Half Yearly Examination – (2019-20)

Class: - XI **F.M.: - 80**

Subject: - MATHEMATICS **Duration: - 3 hr**

General Instructions:-

- All the questions are compulsory.
- The questions paper consists of 36 questions divided into 4 sections A, B, C and D.
- Section A comprises of 20 questions of 1 mark each. Section B comprises of 6 questions of 2 marks each. Section C comprises of 6 questions of 4 marks each. Section D comprises of 4 questions of 6 marks each.
- There is no overall choice. However, an internal choice has been provided in two questions of 1 mark each, two questions of 2 marks each, four questions of 3 marks each and three questions of 4 marks each. You have to attempt only one of the alternatives in all such questions.

SECTION-A

1. For two sets $A \cup B = A$ if

(a) $B \subseteq A$ (b) $A \subseteq B$ (c) $A \neq B$ (d) $A = B$

2. If A = {1, 3, 5, B} and B = {2, 4}, then

(a) $4 \in A$ (b) $\{4\} \subset A$ (c) $B \subset A$ (d) None of these

3. For any set A, (A')' is equal to

(a) A' (b) A (c) ϕ (d) A''

4. The number of subsets of a set containing n element is

(a) n (b) $2^n - 1$ (c) n^2 (d) 2^n

5. Two finite sets have m and n elements. The number of elements in the power set of first set is 48 more than the total number of elements in power set of the second set. Then, the values of m and n are:

(a) 7, 6 (b) 6, 3 (c) 6, 4 (d) 3, 7

6. The symmetric difference of A = {1, 2, 3} and B = {3, 4, 5} is

(a) {1, 2} (b) {1, 2, 4, 5} (c) {4, 3} (d) {2, 5, 1, 4, 3}

7. Find the value of $(i)^{-50}$.

8. Find the the multiplicative inverse of $\sqrt{5}+3i$.

9. Find the argument of the complex number Z = -1-3 i.

10. Change $47^o\ 30'$ into radian measure.

11. Change $\frac{7\pi}{6}$ into degree measure.

12. Find the value of tanx and secx, if sinx = $\frac{3}{5}$. If x lies in second quadrant.

13. Evaluate sin 765^o.

14. Evaluate $\tan\frac{19\pi}{3}$.

15. Find the value of tan 15^o.

16. Find the sum of first n and natural numbers.

17. Find next three terms of the sequence 2,8,32 ……..

18. In a given G.P. first term is 729 and seventh term is 64. Find S_7.

19. Find 11^{th} term of the A.P. whose n^{th} term is 4n+7.

20. Three angles of a triangle are in A.P. difference between angles is 10^o. Find all angles.

SECTION-B

21. A wheel makes 360 revolution In 1 minute. Through how many radians does it turn in 1 second .

22. In a group of 400 people, 250 can speak Hindi and 200 can speak English. How many people can speak both Hindi and English.

23. Solve the equation $2x^2+x+1=0$.

24. Express the given complex number in the form of a + i b: $(\frac{1}{5}+\frac{2}{5}i)\ (\frac{1}{5}-\frac{2}{5}i)$.

25. Find the sum of odd integers from 1 to 2001.

26. Find the 12^{th} term of G.P. whose 8^{th} term is 192 and common ratio is 2.

SECTION-C

27. Find the general solution of the equation cos3x + cosx – cos2x = 0.

28. Convert the given complex number into polar form: $\sqrt{3}$ + i.

29. Evaluate $\sum_{k=1}^{11} (2 + 3^k)$.

30. Find the sum of n terms of the sequence, 8, 88, 888, 8888, ……

31. Prove that cos($\frac{3}{4}\pi$+X) - cos($\frac{3}{4}\pi$ - X) = -$\sqrt{2}$ sinX .

32. Evaluate $\sqrt{1 + \sqrt{3}i}$

SECTION-D

33. Prove that $\cos 6x = 32\cos^6 x - 48\cos^4 x + 18\cos^2 x - 1$.

34. Prove that $\sin 3x + \sin 2x - \sin x = 4\sin x \cos\frac{x}{2} \cos\frac{3x}{2}$.

35. The sum of three numbers in G.P. is 56. If we subtract 1,7,21 from these numbers in that order, we obtain an arithmetic progression. Find the numbers.

36. In a survey of 60 people, it was found that 25 people read newspaper H, 26 people read newspaper T, 26 people read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all the newspaper. Find :

i. The number of people who read at least one of the newspaper.

ii. The number of people who read exactly one newspaper.