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Questions:

Multiple Choice Question

1. Euclid's division lemma states that for positive integers a and b, there exist unique integers q and r such that a = bq + r , where r must satisfy
   (a) $1 < r < b$ (b) $0 < r < b$ (c) $0 \leq r < b$ (d) $0 < r \leq b$
2. Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are
   (a) 0, 1, 8 (b) 1, 4, 8 (c) 0, 1, 3 (d) 0, 1, 3
3. The sum of the exponents of the prime factors in the prime factorization of 1729 is
   (a) 1 (b) 2 (c) 3 (d) 4
4. An A.P. consists of 31 terms. If its 16^{th} term is m, then the sum of all the terms of this A.P. is
   (a) 16 m (b) 62 m (c) 31 m (d) $\frac{31}{2}$ m
5. In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120?
   (a) 6 (b) 7 (c) 8 (d) 9
6. If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + ... + 2^0$ Which of the following is true?
   (a) B is 2^{64} more than A (b) A and B are equal (c) B is larger than A by 1 (d) A is larger than B by 1
7. The next term of the sequence $\frac{3}{16}, \frac{1}{8}, \frac{1}{12}, \frac{1}{18}, ...$ is
   (a) $\frac{1}{24}$ (b) $\frac{1}{27}$ (c) $\frac{2}{3}$ (d) $\frac{1}{81}$
8. If the sequence $t_1, t_2, t_3...$ are in A.P. then the sequence $t_6, t_{12}, t_{18},....$ is
   (a) a Geometric Progression (b) an Arithmetic Progression (c) neither an Arithmetic Progression nor a Geometric Progression (d) a constant sequence
9. Given $a_1 = -1$, $a = \frac{a_n}{n+2}$, then a_4 is _____
   (a) $-\frac{1}{20}$ (b) $-\frac{1}{4}$ (c) $-\frac{1}{840}$ (d) $-\frac{1}{120}$
10. The first term of an A.P. whose 8^{th} and 12^{th} terms are 39 and 59 respectively is _____
    (a) 5 (b) 6 (c) 4 (d) 3
11. In the arithmetic series Sn = k + 2k + 3k +...+ 100, k is positive integer and k is a factor 100 then S_n is _____
    (a) $1000\frac{10}{k}$ (b) $5000\frac{50}{k}$ (c) $\frac{1000}{k} + 10$ (d) $\frac{5000}{k} + 50$
12. If p^{th}, q^{th} and r^{th} terms of an A.P. are a, b, c respectively, then (a(q - r) + b(r - p) + c(p - q) is _____
    (a) 0 (b) a + b + c (c) p + q + r (d) pqr
13. Sum of infinite terms of G.P is 12 and the first term is 8. What is the fourth term of the G.P?
    (a) $\frac{8}{27}$ (b) $\frac{4}{27}$ (c) $\frac{8}{20}$ (d) $\frac{1}{3}$
14. A square is drawn by joining the mid points of the sides of a given square in the same way and this process continues indefinitely. If the side of the first square is 4 cm, then the sum of the area of all the squares is _____
    (a) 8 cm^2 (b) 16 cm^2 (c) 32 cm^2 (d) 64 cm^2
15. A boy saves Rs. 1 on the first day Rs. 2 on the second day, Rs. 4 on the third day and so on. How much did the boy will save upto 20 days?
    (a) $2^{19} + 1$ (b) $2^{19} - 1$ (c) $2^{20} - 1$ (d) $2^{21} - 1$
16. The sum of first n terms of the series a, 3a, 5a...is _____
    (a) na (b) (2n - 1)a (c) $n^2 - a$ (d) n^2a^2
17. If p, q, r, x, y, z are in A.P, then 5p + 3, 5r + 3, 5x + 3, 5y + 3, 5z + 3 form _____
    (a) a G.P (b) an A.P (c) a constant sequence (d) neither an A.P nor a G.P
18. In an A.P if the p^{th} term is q and the q^{th} term is p, then its n^{th} term is _____
    (a) p+q-n (b) p+q+n (c) p-q+n (d) p-q-n
19. Sum of first n terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + ...$ is _____
    (a) $\frac{n(n+1)}{2}$ (b) $\sqrt{n}$ (c) $\frac{n(n+1)}{\sqrt{2}}$ (d) 1
20. HCF of two equal positive integers k, k is _____
    (a) k (b) 1 (c) 0 (d) none of the above
21. Euclid's division lemma can be used to find the _____ of any two positive integers
    (a) HCF (b) Multiples (c) Both (d) None of these
22. Euclid's division lemma is not applicable for which values of b?
    (a) Positive integer (b) Zero (c) Negative integer (d) All of these
23. Using Euclid's division lemma HCF of 455 and 42 can be expressed as_____
    (a) 455 = 42 x 9 + 77 (b) 455 = 42 x 10 + 35 (c) 455 = 42 x 11 - 7 (d) 455 = 42 x 12 - 49
24. The number 132 is to be written as product of its prime factors. Which of the following is correct?
    (a) 132 = 2 x 6 x 11 (b) 132 = 2^2 x 3 x 11 (c) 132 = 2^2 x 3^2 x 5 (d) 132 = 3 x 4 x 11
25. What is the sum of the prime factors to 240?
    (a) 16 (b) 14 (c) 12 (d) 10
26. 25 + 37 ≡ _____ (mod 12)
    (a) 2 (b) 3 (c) 1 (d) 62
27. What does 144 reduces to mod 11?
    (a) 144 (b) 1 (c) 2 (d) 143
28. First term and common difference in the sequence 7, 10, 13,....
    (a) 1, 7 (b) 7, 10 (c) 7, 3 (d) 13, 10
29. If the first term of an A.P. is a and n^{th} term is b, then the common difference is_____
    (a) $\frac{b-a}{n+1}$ (b) $\frac{b-a}{n-1}$ (c) $\frac{b-a}{n}$ (d) $\frac{b+a}{n-1}$

30. The common differences of the A.P. $\frac{1}{3}, \frac{1-3b}{3}, \frac{1-6b}{3}$,...is

(a) $\frac{1}{3}$ (b) $\frac{-1}{3}$ (c) - b (d) b

31. If a, b, c are in A.P then $\frac{a-b}{b-c}$ is equal to _____

(a) $\frac{a}{b}$ (b) $\frac{b}{c}$ (c) $\frac{a}{c}$ (d) 1

32. The sum of n terms of an A.P. is $3n^2 + 5n$, then which of its term is 164?

(a) 26^{th} (b) 27^{th} (c) 28^{th} (d) None of these

33. The first, second and last term of an A.P. are a, b and 2a respectively, its sum is _____

(a) $\frac{ab}{2(b-a)}$ (b) $\frac{ab}{b-a}$ (c) $\frac{3ab}{2(b-a)}$ (d) None of these

34. 7^{th} term of a G.P. 2, 6, 18 . . is _____

(a) 5832 (b) 2919 (c) 1458 (d) 729

35. No term of a geometric sequence be _____

(a) 3 (b) 1 (c) 2 (d) 0

36. The sequence -3, -3, -3 ..... is _____

(a) an A. P only (b) a G.P only (c) neither A.P nor G.P (d) both A.P and G.P

37. Sum of n terms of a G.P. is _____

(a) $\frac{n}{2}[2a + (n-1)d]$ (b) $\frac{a(1-r^n)}{1-r}$ (c) $\frac{2ab}{(a+b)}$ (d) $\frac{a+b}{2}$

38. Sum of 7 terms of -2, 6, -18, . . . is _____

(a) 1094 (b) - 1094 (c) 9041 (d) -9041

39. $\frac{5+9+13+\ldots \text{ton terms}}{7+9+11+\ldots \text{to } (n+1) \text{ terms}} = \frac{17}{16}$ then n = ?

(a) 8 (b) 7 (c) 10 (d) 11

40. The sum of first n odd natural number is _____

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

41. If 1 + 2+ 3 + . . . + 10 = 55, then, $1^3 + 2^3 + 3^3 + \ldots\ldots 10^3$ = ?

(a) 55^2 (b) 10^2 (c) 55^3 (d) 10^3

42. $1^2 + 2^2 + 3^2 \ldots\ldots + n^2$ = ?

(a) $\left[\frac{n(n+1)}{2}\right]^2$ (b) $\frac{n(n+1)}{2}$ (c) n^2 (d) $\frac{n(n+1)(2n+1)}{6}$

43. If 2 + 4 + 6 + ... 2k = 90, then the value of k is _____

(a) 8 (b) 9 (c) 10 (d) 11

44. Statement I - A sequence can be considered as a function defined on the set of natural numbers.
Statement II - Though all the sequences are functions, not all the functions are sequences.

(a) Statement I is true and Statement II is false (b) Statement I is false and Statement II is true (c) Both the statements are true (d) Both the statements are false.

45. The Value of r_1 such that 1 + r + r^2 + r^3 +_____ = 3/4

(a) 1/3 (b) -1/3 (c) 3 (d) -3

46. If t_n is the n^{th} term of an A.P., then $t_{8n} - t_n$ is :

(a) (8n - 1)d (b) (8n - 2)d (c) (7n - 2)d (d) (7nd)

47. Let a and b be two positive integers such that $a = p^3q^4$ and $b = p^2q^3$, where p and q are prime numbers. If HCF(a, b) = p^mq^n and LCM(a, b) = p^rq^s , then (m+n)(r+s)=

(a) 15 (b) 30 (c) 35 (d) 72

48. If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$, where x, y are prime numbers, then the result obtained by dividing the product of the positive integers by the LCM (a, b) is

(a) xy (b) xy^2 (c) x^3y^3 (d) x^2y^2

49. Two APs have the same common difference. The first term of one of these is –1 and that of the other is – 8. The difference between their 4th terms is

(a) 1 (b) -7 (c) 7 (d) 9

50. Statement A (Assertion): -5, -5/2, 0, 5/2,.... is in Arithmetic Progression.
Statement R (Reason) : The terms of an Arithmetic Progression cannot have both positive and negative rational numbers.

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A)
(b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

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