COMMON QUARTERLEY EXAMINATION - 2019

Standard IX

Reg.No

MATHEMATICS

Time: 2.30 hours

Marks: 100

Part - I

I. Choose the correct answer: 14 x 1 = 14

1. If $B \subseteq A$ then $n(A \cap B)$ is
   a) $n(A - B)$ b) $n(B)$ c) $n(B - A)$ d) $n(A)$
2. If $A = \{x,y,z\}$ then the number of non-empty subsets of A is
   a) 8 b) 5 c) 6 d) 7
3. If $U = \{x : x \in N \text{ and } x < 10\}$, $A = \{1,2,3,5,8\}$ and $B = \{2,5,6,7,9\}$, then $n[(A \cup B)']$ is
   a) 1 b) 2 c) 4 d) 8
4. For any three sets P,Q and R, $P-(Q \cup R)$ is
   a) $P - (Q \cup R)$ b) $(P \cap Q) - R$ c) $(P - Q) \cup (P - R)$ d) $(P - Q) \cap (P - R)$
5. $(A - B) \cap (B - A) =$ _____.
   a) $A \cap B$ b) ϕ c) A d) B
6. Which of the following has a terminating decimal expansion?
   a) $\frac{5}{64}$ b) $\frac{8}{9}$ c) $\frac{14}{15}$ d) $\frac{1}{12}$
7. $0.3\overline{4} + 0.3\overline{4} =$ _____.
   a) $0.6\overline{87}$ b) $0.\overline{68}$ c) $0.6\overline{8}$ d) $0.68\overline{7}$
8. If $\sqrt{80} = k\sqrt{5}$, then k = _____.
   a) 2 b) 4 c) 8 d) 16
9. If $\sqrt{9^x} = \sqrt[3]{9^2}$, then x = _____.
   a) $\frac{2}{3}$ b) $\frac{4}{3}$ c) $\frac{1}{3}$ d) $\frac{5}{3}$
10. If $N = a \times 10^n$ and 'n' is an integer is called as scientific notation, where a is
    a) $1 \le a \le 10$ b) $1 \le a < 10$ c) $1 < a < 10$ d) $1 < a \le 10$
11. If P(a) = 0, then (x - a) is a _____ of P(x).
    a) divisor b) quotient c) reminder d) factor
12. $(x + y)(x^2 - xy + y^2)$ is equal to
    a) $(x + y)^3$ b) $(x - y)^3$ c) $x^3 + y^3$ d) $x^3 - y^3$
13. GCD of any two prime numbers is _____.
    a) -1 b) 0 c) 1 d) 2
14. Which of the following is true?
    a) Number of zeros of a polynomial ≤ the degree of the polynomial
    b) Number of zeros of a polynomial < the degree of the polynomial
    c) The degree of the polynomial ≤ Number of zeros of a polynomial
    d) The degree of the polynomial < Number of zeros of a polynomial

Part - II (Marks 20)

II. Answer any 10 questions: (Ques.No.28 is compulsory) 10 x 2 = 20

15. Define Power set.
16. Represent $(A \cap B)'$ through Venn diagram.
17. If P = {2,3,5,7,11} and Q = {1,3,5,11} then find the symmetric difference between the sets.
18. If n[P(A)] = 256, find n(A).
19. Out of 500 car owners investigated, 400 owned car A and 200 owned car B, 50 owned both A and B cars. Is this data correct?
20. Convert $0.4\overline{5}$ in the form of $\frac{p}{q}$ $(p,q \in Z \text{ and } q \neq 0)$

21. Divide $\sqrt[9]{8}$ by $\sqrt[6]{6}$
22. Express in scientific notation i) 0.04567891 ii) 72003865.48
23. Simplify: $(2.75 \times 10^{2}) + (1.23 \times 10^{3})$
24. Find the value of m, if $(x - 2)$ is a factor of the polynomial $2x^3 - 6x^2 + mx + 4$
25. Expand $(3a - 4b)^3$
26. Factorise $27x^3 + 8y^3$
27. Find the GCD $x^3 - 1, x^2 - 1$
28. Factorise i) $2x^2 - 15x - 27$ ii) $9 - 18x + 8x^2$

Part - III (Marks 50)

III. Answer any 10 questions: (Ques.No.42 is compulsory) $10 \times 5 = 50$

29. Verify $A - (B \cap C) = (A - B) \cup (A - C)$ using Venn diagrams.
30. If $P = \{x : x \in W \text{ and } 0 \le x \le 10\}$, $Q = \{x, x=2n+1, n \in W \text{ and } n \le 5\}$ and $R = \{2,3,5,7,11,13\}$, then verify $P - (Q \cup R) = (P - Q) \cap (P - R)$
31. If $U = \{x : x \in Z, -2 \le x \le 10\}$, $A = \{x : x=2p+1, p \in Z, -1 \le p \le 4\}$, $B = \{x : x=3q+1, q \in Z, -1 \le q \le 4\}$, then Verify $(A \cup B)' = A' \cap B'$
32. Let $U = \{0,1,2,3,4,5,6,7\}$, $A = \{1,3,5,7\}$ and $B = \{0,2,3,5,7\}$, find the following sets
    i) A' ii) B c) $A' \cup B'$ iv) $A' \cap B'$ v) $(B')'$
33. In a colony, 275 families buy Tamil newspaper, 150 families buy English newspaper, 45 families buy Hindi newspaper, 125 families buy Tamil and English newspapers, 17 families buy English and Hindi newspapers, 5 families buy Tamil and Hindi newspapers and 3 families buy all the three newspapers. If each family buy atleast one of these newspapers then find i) Number of families buy only one newspaper
    ii) Number of families buy atleast two newspapers
    iii) Total number of famillies in the colony.
34. Arrange in ascending order: $\sqrt[3]{2}, \sqrt[2]{4}, \sqrt[4]{3}$
35. Express $\sqrt[3]{(1024)^{-2}}$ in its simplest form and find its oder, radicand and coefficient
36. Simplify: $5\sqrt[3]{80} - 2\sqrt[3]{625} - 3\sqrt[3]{320}$
37. Find the value of a and b if $\frac{\sqrt{7}-2}{\sqrt{7}+2} = a\sqrt{7} + b$
38. Find the area of square whose side length is $3m + 2n - 4\ell$.
39. If $x^2 + \frac{1}{x^2} = 23$, then find the value of $x + \frac{1}{x}$ and $x^3 + \frac{1}{x^3}$
40. Find quotient and the remainder when f(x) is divided by g(x).
    $f(x) = (8x^3 - 6x^2 + 15x - 7)$, $g(x) = 2x + 1$
41. If the quotient obtained on dividing $3x^3 + 11x^2 + 34x + 106$ by $x + 3$ is $3x^2 + ax + b$, then find a,b and also the remainder.
42. Factorise: $x^3 - 5x^2 - 2x + 24$

Part - IV (Marks : 16)

IV. Answer both questions: $2 \times 8 = 16$

43. a) Construct the $\triangle LMN$ such that LM = 7.5 cm, MN = 5 cm and LN = 8 cm. Locate its centroid.

    (or)

    b) Construct $\triangle PQR$ whose sides are PQ = 6 cm, $\angle Q = 60^\circ$ and QR = 7 cm and locate its orthocentre.
44. a) Draw the graph for $y = 3x - 1$ *(or)*
    b) Draw the graph for $3x + 2y = 14$

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