EPITOME MODEL ISLAMIC SCHOOLS

MATHEMATICS INTERVIEW QUESTIONS

Instruction: Attempt all questions from this section

Time Allowed for this section: 20 minutes

SECTION A: MCQ

1. Convert the binary number 101101 to its decimal equivalent.
   A. 45
   B. 46
   C. 47
   D. 48

2. In base 8, what is the value of $(456)_8$ when converted to base 10?
   A. 298
   B. 300
   C. 302
   D. 304

3. Express 0.625 as a fraction in its lowest terms.
   A. 1/2
   B. 3/4
   C. 5/8
   D. 7/10

4. Simplify $\sqrt{(16/81)}$ in its simplest radical form.
   A. 4/9
   B. 2/9
   C. 4/3
   D. 2/3

5. What is the value of $2^3 \times 3^2$ in standard form?
   A. 72
   B. 512
   C. 216
   D. 648

6. If a:b = 3:4 and b:c = 5:6, what is the ratio a:c?
   A. 3:6
   B. 15:24
   C. 5:8
   D. 3:10

7. Convert 0.375 to a percentage.
   A. 37.5%
   B. 3.75%
   C. 375%
   D. 0.375%

8. If 20% of a number is 45, what is 35% of the same number?
   A. 78.75

B. 225
C. 63
D. 90

9. Simplify the ratio 48:72:96 to its lowest terms.
A. 2:3:4
B. 4:6:8
C. 1:2:3
D. 3:4:6

10. A mixture contains 2/5 salt and the rest water. If 3 liters of water is added, the salt becomes 1/3 of the new mixture. Find the original volume of the mixture.
A. 6 liters
B. 9 liters
C. 12 liters
D. 15 liters

11. Simplify $8^{(2/3)} \times 2^{(-1/3)}$.
A. 4
B. 2
C. 8
D. 1/2

12. Solve for x: log_2 (x) + log_2 (x-1) = 1.
A. x = 2
B. x = $\sqrt{2}$
C. x = 1 + $\sqrt{2}$
D. x = 3

13. If $3^x = 81$, what is the value of x?
A. 4
B. 3
C. 2
D. 5

14. Express log_10 (100 / 10) as a single logarithm.
A. log_10 10
B. 1
C. 0
D. 2

15. Simplify $(16^{(3/4)}) / (4^{(1/2)})$.
A. 2
B. 4
C. 8
D. 1

16. If A = {1, 2, 3, 4}, B = {3, 4, 5, 6}, find A ∩ B.
A. {3, 4}
B. {1, 2, 5, 6}

C. {1, 2, 3, 4, 5, 6}
D. Ø

17. The universal set U = {1,2,3,4,5,6,7,8,9,10}, A = {even numbers}, B = {multiples of 3}. Find n(A ∪ B).
A. 6
B. 7
C. 8
D. 10

18. If n(A) = 5, n(B) = 7, n(A ∪ B) = 9, find n(A ∩ B).
A. 3
B. 4
C. 2
D. 1

19. Factorize x^2 - 5x - 24 completely.
A. (x-8)(x+3)
B. (x-6)(x+4)
C. (x-3)(x-8)
D. (x+6)(x-4)

20. Solve the quadratic equation x^2 - 6x + 8 = 0 by factorization.
A. x=2,4
B. x=1,8
C. x=3,3
D. x=-2,-4

21. Solve the inequality 2x - 3 > 5 and express in interval notation.
A. (4, ∞)
B. [4, ∞)
C. (-∞, 4)
D. [4, ∞)

22. Expand $(2x + 3y)^2$.
A. $4x^2$ + 12xy + 9y^2
B. $4x^2$+ 6xy + 9y^2
C. $4x^2$+ 12xy + 3y^2
D. $4x^2$+ 9y^2

23. If f(x) = $2x^2$ - 3x + 1, find f(-1).
A. 6
B. 2
C. 0
D. 4

24. Solve for x: $3^{(x+1)}$ = 27.
A. 2
B. 3
C. 1

D. 4

25. Simplify $(x^2 + 2x + 1)/(x + 1)$.
A. x + 1
B. x - 1
C. x^2 + 1
D. x

26. The roots of the equation $x^2 - px + q = 0$ are 2 and 3. Find p and q.
A. p=5, q=6
B. p= -5, q= -6
C. p=1, q=6
D. p=5, q= -6

27. Find the 5th term of the arithmetic sequence where first term a=2, common difference d=3.
A. 14
B. 11
C. 8
D. 17

28. The sum of the first n terms of a GP is given by $S_n = 3(2^n - 1)$. Find the first term.
A. 3
B. 1
C. 2
D. 6

29. In an AP, if the 3rd term is 7 and the 7th term is 15, find the common difference.
A. 2
B. 1
C. 3
D. 4

30. In a triangle ABC, angle A = 40°, angle B = 60°. What is angle C?
A. 80°
B. 100°
C. 70°
D. 90°

31. The exterior angle of a regular polygon is 72°. How many sides does it have?
A. 5
B. 6
C. 4
D. 8

32. In circle with center O, chord AB subtends 120° at the center. What is the angle at the circumference?
A. 60°
B. 120°
C. 90°
D. 30°

33. Prove that the sum of angles in a quadrilateral is 360° (conceptual: which theorem?). But MCQ: The reason is based on:
A. Two triangles
B. One triangle
C. Circle theorem
D. Pythagoras

34. If two lines are parallel, and a transversal makes 65° with one, what is the corresponding angle?
A. 65°
B. 115°
C. 90°
D. 180°

35. Find the area of a circle with radius 7 cm (use π=22/7).
A. 154 cm²
B. 44 cm²
C. 22 cm²
D. 49 cm²

36. The volume of a cylinder with radius 5 cm and height 10 cm is:
A. 250π cm³
B. 50π cm³
C. 100π cm³
D. 785 cm³ (approx)

37. Surface area of a cube with side 4 cm.
A. 96 cm²
B. 64 cm²
C. 24 cm²
D. 16 cm²

38. The area of a trapezium with parallel sides 10 cm and 6 cm, height 5 cm.
A. 40 cm²
B. 80 cm²
C. 30 cm²
D. 50 cm²

39. If a cone has base radius r and slant height l, surface area (lateral) is:
A. πrl
B. πr²
C. 2πrl
D. πr(l + r)

40. In a right triangle, sin θ = 3/5, find cos θ.
A. 4/5
B. 3/4
C. 5/3
D. 5/4

Answers

1A, 2. C, 3. C, 4. A, 5. A, 6. B, 7. A, 8. A, 9. A, 10. A,
11. A, 12. A, 13. A, 14. A, 15. C, 16. A, 17. B, 18. A, 19. A, 20. A,
21.A, 22. A, 23. A, 24. A, 25. D, 26. A, 27. A, 28. A, 29. A, 30. A,
31.A, 32. A, 33. A, 34. A, 35. A, 36. A, 37. A, 38. A, 39. A, 40. A