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

(a) $B \subseteq A$

(b) $A \subseteq B$

(c) $A \neq B$

(d) $A \cap B = \emptyset$

2. If $A \subset B$, then $A \cap B$ is

(a) B

(b) $A \setminus B$

(c) A

(d) $B \setminus A$

3. For any two sets P and Q, $P \cap Q$ is

(a) $\{x : x \in P \text{ or } x \in Q\}$

(b) $\{x : x \in P \text{ and } x \notin Q\}$

(c) $\{x : x \in P \text{ and } x \in Q\}$

(d) $\{x : x \notin P \text{ and } x \in Q\}$

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4. If $A = \{ p, q, r, s \}$, $B = \{ r, s, t, u \}$, then $A \setminus B$

(a) $\{ p, q \}$

(c) $\{ r, s \}$

(b) $\{ t, u \}$

(d) $\{ p, q, r, s \}$

5. If n[p(A)]= 64, then $n(A)$ is

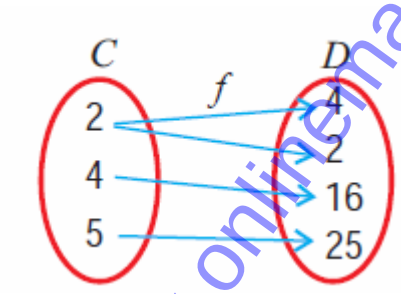
(a) 6

(c) 4

(b) 8

(d) 5

6.



The above diagram represents

(a) an onto function

(c) an one-one function

(b) a constant function

(d) not a function

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7. In a school of 4000 students, 2000 know French, 3000 know Malay and 500 know English, 1500 know French and Malay, 300 know French and English, 200 know Malay and English and 50 know all the three languages. How many do not know any of the three languages?

(a) 350

(c) 450

(b) 650

(d) 500

8. Let $A = \{ 1, 2, 3, 4, 5 \}$, $B = N$ and $f: A \rightarrow B$ be defined by $f(x) = x^2$. Find the range of "f".

(a) {1, 4, 9, 16, 25}

(c) {1, 2, 3, 4, 5}

(b) { 2, 3, 4, 5 }

(d) { 1, 2, 3, 4}

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9. The function f(x) is defined as follows

$$f(x)=\begin{cases}1+x & 1\le x<2\\ 2x-1 & 2\le x<4\\ 3x^2-10 & 4\le x<6\end{cases}$$

Then the value of 2f(5)-3f(1) is

(a) 152

(c) 124

(b) 259

(d) 134

10. Write the first three terms in a sequence whose n^{th} term is given by

$$c_n=\frac{n(n+1)(2n+1)}{6} \qquad \forall\, n\in\mathbb{N}$$

(a) 1, 5, 14

(c) 1, 3, 5

(b) 2, 4, 6

(d) 1, 2, 3

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11. 2, 1.5, 1, 0.5, 0, - 0.5, - 1.0, - 1.5,g is a/an

(a) H.P

(b) A.P

(c) G.P

(d) None of these

12. Mr. Mark has a garden in which there are 23 rose plants in the first row, 21 in the second row, 19 in the third row and so on. There are 5 rose plants in the last row. How many rows are there in the flower garden?

(a) 5

(b) 6

(c) 16

(d) 10

13. Three numbers are in the ratio 2 : 5 : 7. If 7 is subtracted from the second, the resulting numbers form an arithmetic sequence. Determine the numbers.

(a) 20,70, 59

(b) 89, 118, 135

(c) 41, 63, 72

(d) 28, 70, 98

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14. A person has deposited $25000 in an investment which yields 14% simple interest annually. Do these amounts (principal + interest) form an A.P.? If so, determine the amount of investment after 20 years.

(a) 71500

(b) 81500

(c) 91500

(d) 111500

15. The 4^{th} term of a geometric sequence is 2/3 and the seventh term is 16/81. Find the first term.

(a) 9/4

(b) 5/4

(c) 3/4

(d) 11/4

16. The sum of first three terms of a geometric sequence is 13/12 and their product is -1. Find the common ratio.

(a) 4/3 or -3/4

(b) -4/3 or -3/4

(c) -4/3 or 3/4

(d) 4/3 or 3/4

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17. A company purchases an office copier machine for $50,000. It is estimated that the copier depreciates in its value at a rate of 45% per year. What will be the value of the copier after 15 years?

(a) $5000\ (55/100)^{15}$

(b) $5000\ (44/100)^{15}$

(c) $5000\ (33/100)^{15}$

(d) $5000\ (22/100)^{15}$

18. Find the sum of the below series

$$1^3 + 2^3 + 3^3 + \cdots + 20^3$$

(a) 42100

(b) 43200

(c) 41600

(d) 44100

19. Solve by elimination method $3x + 4y = -25,\ 2x - 3y = 6$

(a) (-3,-4)

(b) (1,2)

(c) (2,3)

(d) (1,8)

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20. A fraction is such that if the numerator is multiplied by 3 and the denominator is reduced by 3, we get 18/11, but if the numerator is increased by 8 and the denominator is doubled, we get 2/5. Find the fraction.

(a) 47/35

(c) 12/25

(b) 37/51

(d) 34/57

21. A train travelled a certain distance at a uniform speed. If the train had been 6 km/hr faster, it would have taken 4 hours less than the scheduled time. If the train were slower by 6 km/hr, then it would have taken 6 hours more than the scheduled time. Find the distance covered by the train.

(a) 850 km

(c) 550 km

(b) 160 km

(d) 720 km

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22.

$$x^3 - 3x^2 - 10x + 24$$

The factors of the above polynomial are

(a) (x-4)(x-3)(x-2)

(c) (x-4)(x-3)(x+2)

(b) (x-4)(x+3)(x-2)

(d) None of these

23. Find the GCD of the following

$$6(2x^2 - 3x - 2),\ 8(4x^2 + 4x + 1),\ 12(2x^2 + 7x + 3)$$

(a) 2(2x+1)

(c) 3(3x+1)

(b) 4(4x+1)

(d) 5(5x+1)

24. Find the L.C.M of the following.

$$x^3 + y^3,\ x^3 - y^3,\ x^4 + x^2y^2 + y^4$$

(a) x^4-y^4

(c) x^6-y^6

(b) x^5-y^5

(d) x^7-y^7

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25. Simplify the below rational expressions into its lowest form.

$$\frac{(x-3)(x^2-5x+4)}{(x-1)(x^2-2x-3)}$$

(a) (x+4)/(x-1)

(c) (x-4)/(x+1)

(b) (x+3)/(x-1)

(d) (x+5)/(x+2)

26. Multiply:

$$\frac{x^3-8}{x^2-4} \text{ by } \frac{x^2+6x+8}{x^2+2x+4}$$

(a) x+7

(c) x+1

(b) x+3

(d) x+4

27. A rectangular field is 20 m long and 14 m wide. There is a path of equal width all around it having an area of 111 sq. metres. Find the width of the path on the outside.

(a) 5/7 m

(c) 3/2 m

(b) 3/8 m

(d) 1/2 m

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28. Find the values of k for which the roots are real and equal in the following
Equation.

$$(k+1)x^2 - 2(k-1)x + 1 = 0$$

(a) 0 or 3

(c) 3 or-10

(b) 5 or 2

(d) 9 or 8

29. The table shows a five-day forecast indicating high (H) and low (L) temperatures in Fahrenheit. Organise the temperatures in a matrix where the first and second rows represent the High and Low temperatures respectively and identify which day will be the warmest?

Mon	Tue	Wed	Thu	Fri
				
H 88	H 90	H 86	H 84	H 85
L 54	L 56	L 53	L 52	L 52

(a) Monday

(c) Sunday

(b) Saturday

(d) Tuesday

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30. Write the order of the below matrix.

$$\begin{pmatrix} 5 & 0 & 7 \\ 0 & 15 & 1 \\ 1 & 6 & 2 \\ 10 & 9 & 8 \end{pmatrix}$$

(a) 4x3

(c) 3x4

(b) 5x8

(d) None of these

31. In what ratio does the point $P(-2, 3)$ divide the line segment joining the points $A(-3, 5)$ and $B(4, -9)$ internally?

(a) 4:2

(c) 3:3

(b) 5:6

(d) 1:6

32. If (7,3), (6,1), (8,2) and $(p, 4)$ are the vertices of a parallelogram taken in order, then find the value of p.

(a) 9

(c) 1

(b) -1

(d) None

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33. Find the area of the quadrilateral formed by the points (-4, -2), (-3, -5), (3, -2) and (2, 3).

(a) 43

(c) 30

(b) 28

(d) 68

34. Find the angle of inclination of the straight line whose slope is $1/\sqrt{3}$

(a) 30

(c) 16

(b) 60

(d) 18

35. Find the equation of the straight line passing through the points (-1,1) and (2,- 4).

(a) 5X+3Y+2=0

(c) 5X+3Y-2=0

(b) 5X-3Y+2=0

(d) None of these

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36. If the *x*-intercept and *y*-intercept of a straight line are 2/3 and 3/4 respectively, then the equation of the line is

(a) 9X+8Y+6=0

(c) 9X-8Y+6=0

(b) 9X-8Y-6=0

(d) None of these

37. If two lines are parallel, then which of the following is true?

I. Slopes are equal.
II. Product of the slopes =-1

(a) I &II both

(c) I only

(b)Neither I nor II

(d) None of these

38. The value of (sin30 - cos60 + tan45) is

(a) 6/5

(c) 3/2

(b) 1/3

(d) 1

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39. Find the area of an isosceles triangle with base 16 cm and vertical angle 57 degrees.

(a) 117.888 sq.cm

(b) 317.888 sq.cm

(c) 217.888 sq.cm

(d) 517.888 sq.cm

40. A person stands at a distance of 40 m from a building and observe the top and the bottom of a flag pole on the building at angles of elevation 60 and 45 degrees. Find the height of the building.

(a) 40 m

(b) 42 m

(c) 45 m

(d) 48 m

41. Find the co-ordinates of the circumcentre of a triangle whose vertices are (2,-3), (8,-2) and (8,6).

(a) (-3/2,-4/5)

(b) (17/4,2)

(c) (2/3,5/3)

(d) (15/2,8)

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42. Find the co-ordinates of the orthocentre of a triangle whose vertices are (3,1), (0,4) and (-3,1).

(a) (6,5)

(c) (3,2)

(b) (1,3)

(d) (0,4)

43. The weights of 7 persons in kg are 46, 49.5, 52.5, 38, 45, 79.5, and 84.5. Find the coefficient of range

(a) 0.379

(c) 0.278

(b) 0.652

(d) 0.258

44. Calculate the standard deviation for the data 14, 22, 9, 15, 20, 17, 12, 11

(a) 5.92

(c) 2.66

(b) 6.33

(d) 4.18

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45. The variance of five values is 9. If each value is doubled then find the standard deviation of the new values.

(a) 5
(c) 6
(b) 2
(d) 9

46. The coefficient of variation of a series is 69% and its standard deviation is 15.6. Find the arithmetic mean of the series.

(a) 22.6
(c) 16.6
(b) 30.6
(d) 28.6

47. One card is drawn at random from a shuffled pack of 52 cards. Find the probability that it will be a king.

(a) 1/13
(c) 5/84
(b) 3/38
(d) 2/82

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48. There are five items defective in the sample of 25 items. Find the probability that an item chosen at random from the sample space is not defective.

(a) 6/5

(c) 4/5

(b) 2/5

(d) 3/5

49. A metallic sphere 3 cm in diameter is melted and made in to three smaller spheres. If the diameters of the two smaller spheres are 1.5 cm and 2 cm, find the diameter of the third smaller sphere.

(a) 2.5 cm

(c) 5.2 cm

(b) 3.5 cm

(d) 4.5 cm

50. The radius of the top of a bucket is 18 cm and that of the bottom is 6 cm. Its depth is 24 cm. Find the capacity of the bucket.

(a) 4744 π

(c) 3744 π

(b) 5744 π

(d) 7744 π

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Answers					
1. a	2. c	3. c	4. a	5.a	6. d
7. c	8. a	9. c	10. a	11. b	12. d
13. d	14. c	15. a	16. b	17. a	18. d
19. a	20. c	21. d	22. b	23. a	24. c
25. c	26. d	27. c	28. a	29. d	30. a
31. d	32. a	33. b	34.a	35.a	36. b
37. c	38. d	39. a	40. a	41. b	42. d
43. a	44.d	45. c	46. a	47. a	48. c
49. a	50. c				

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