

# GRAND TEST 01

# **IBA** *GRADS*

*Gateway to your desired future*

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instructed to do so**

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question booklet**

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along with your Answer sheet after  
the test.**



## SECTION-01 MATH

45 Questions 80 Minutes

1. If  $y = \frac{a}{a+b}$  and  $x = \frac{a}{b}$ , what is  $y$  in terms of  $x$ ?

- A)  $-\frac{1}{x}$
- B)  $1 + x$
- C)  $1 + \frac{1}{x}$
- D)  $\frac{x}{1+x}$

2. If  $\frac{1}{x} = 4$  and  $y = -6$ , then the value of  $y$  in terms of  $x$  is:

- A)  $-\frac{3}{2x}$
- B)  $\frac{3}{2x}$
- C)  $-\frac{2x}{3}$
- D)  $-x + 6$

3. If  $x + 2y = a$  and  $x - 2y = b$ , which of the following is an expression for  $\frac{x}{y}$ ?

- A)  $2\left(\frac{a+b}{a-b}\right)$
- B)  $2\left(\frac{a-b}{a+b}\right)$
- C) 1
- D) None of these

4.  $\sqrt[5]{\left(\frac{32}{243}\right)^{-2}}$

- A)  $\frac{3}{2}$
- B)  $\frac{4}{9}$
- C)  $\frac{9}{4}$
- D) 36

5.  $\left(\frac{x^b}{x^c}\right)^{(b+c-a)} \cdot \left(\frac{x^c}{x^a}\right)^{(c+a-b)} \cdot \left(\frac{x^a}{x^b}\right)^{(a+b-c)} = ?$

- A)  $x^{abc}$
- B) 1
- C)  $x^{ab+bc+ca}$
- D)  $x^{a+b+c}$

6.  $9^n + 9^n + 9^n = 3^{2019}$ ,  $n = ?$

- A) 2019/2
- B) 2018
- C) 1009
- D) None of these

7.  $\sqrt{12} + \sqrt{128} =$

- A)  $3 + 4\sqrt{2}$
- B)  $1 + 4\sqrt{2}$
- C)  $2 + 2\sqrt{2}$
- D) None of these

8. If  $n$  is an integer, how many different values of  $n$  satisfy the inequality  $-4 \leq 3n \leq 87$ ?

- A) 32
- B) 31
- C) 30
- D) 29

9. If  $x$  is a positive number and  $4|x| + 3 < 11$ , then which of the following must be true?

- A)  $x > -2$
- B)  $x < 2$
- C)  $0 < x < 2$
- D)  $-2 < x < 2$

10. In a certain green house for plants, the Fahrenheit temperature,  $F$ , is controlled so that it does not vary from  $79^\circ$  by more than  $7^\circ$ . Which of the following best expresses the possible range in Fahrenheit temperature of the greenhouse?

- A)  $|F - 79| \leq 7$
- B)  $|F - 79| > 7$
- C)  $|F - 7| \leq 79$
- D)  $|F - 79| > 79$

11. Ali completed  $\frac{3}{8}$  of his work in first day and  $\frac{1}{3}$  of the remainder on the second day. The fractional part of his work remaining at the end of second day is

- A)  $\frac{5}{12}$
- B)  $\frac{5}{24}$
- C)  $\frac{7}{12}$
- D)  $\frac{3}{8}$

12. If the result of increasing  $a$  by 300% is  $b$ , then  $a$  is what percent of  $b$ ?

- A) 20%
- B) 25%
- C)  $33\frac{1}{3}\%$
- D) 40%

13. If the result of increasing  $a$  by 300% is  $b$ , then  $a$  is what percent of  $b$ ?

- A) 20%
- B) 25%
- C)  $33\frac{1}{3}\%$
- D) 40%

14. In a company 10% of male staff are same in number as  $\frac{1}{4}$ th of the female staff. What is the ratio of male staff to female staff is:

- A) 2 : 5
- B) 5 : 2
- C) 3 : 4
- D) 4 : 3

15. The cube root of  $x$  varies inversely as the square of  $y$ . If  $x = 27$  when  $y = 4$ , find the value of  $x$  when  $y = 6$

- A) 18
- B)  $\frac{64}{27}$
- C)  $\frac{27}{4}$
- D)  $\frac{4}{27}$

16. A parking garage charges a rate of  $a$  dollars for the first hour and  $b$  dollars for each additional hour the car is parked. When Jacqueline leaves this parking garage, she is charged  $c$  dollars. In terms of  $a$ ,  $b$ , and  $c$ , what is the number of hours for which Jacqueline is charged?

- A)  $\frac{a+b}{c}$
- B)  $\frac{c-a}{b}$
- C)  $a + cb$
- D)  $1 + \frac{c-a}{b}$

17. The US Olympic Team has  $f$  members, and they will be distributed equally among  $g$  charter planes on their way to Rio in 2016. If the team decides to charter  $h$  more planes, how many fewer athletes will ride on each plane?

- A)  $\frac{fg}{g(g+h)}$
- B)  $\frac{fh}{g(g+h)}$
- C)  $\frac{f}{g+h}$
- D)  $\frac{f}{h}$

18. Seven years ago, a father was four times as old as his son, but in 7 years more he will be only twice as old. What is the age of each?

- A) Father's age 45; Son's age 20 years
- B) Father's age 40 years; Son's age 17 years
- C) Father's age 35 years; Son's age 14 years
- D) Father's age 32 years; Son's age 12 years

19. Faraz purchased brand R pens for Rs. 330/box and brand S pens for Rs.200/box. If Faraz purchased a total of 12 boxes of pens for Rs. 3700, how many boxes of Brand S did he purchase?

- A) 10
- B) 5
- C) 3
- D) 2

20. Two cyclist travel at a rate of 10 km/hour and 15 km/hour. If one takes 45 more minutes to cover the distance, then what distance did they cover?

- A) 58 km
- B) 22.5 km
- C) 4.08 km
- D) 150 km

21. The speeds of three motor bikes are in the ratio 6 : 5 : 4. The ratio between the time taken by them to travel the same distance is :
- A) 10 : 12 : 15  
B) 12 : 10 : 8  
C) 15 : 12 : 10  
D) 10 : 15 : 12
22. Pipe A can fill the tank in 3 hours, Pipe B can fill in 4 hours and Pipe C can empty it in 6 hours. In how many hours will the tank be exactly full?
- A)  $12/7$   
B)  $4/3$   
C)  $12/5$   
D) None of these
23. The average weight of 5 kids is 60 cm. One kid whose height was 45cm was taken as 75cm by mistake. Find the correct average.
- A) 45  
B) 50  
C) 54  
D) 75
24. Five times the second of three consecutive odd integers is thirteen less than three times the sum of the first and third integers. Find the largest odd integer.
- A) 9  
B) 11  
C) 15  
D) 13
25. What is the 6<sup>th</sup> term of a geometric sequence if the difference between its 4<sup>th</sup> and 2<sup>nd</sup> is 120 and between its 5<sup>th</sup> and 3<sup>rd</sup> is 480?
- A) 2048  
B) 1024  
C) 512  
D) 128

26. The first term of an arithmetic sequence is 5 and the sum of its first 7 terms is 98. What is the sum of the first 21 terms of the arithmetic sequence?

- A) 735
- B) 798
- C) 385
- D) None of these

27. If the roots of  $3x^2+kx+12 = 0$  are equal then  $k=$

- A) 36
- B)  $\pm 6$
- C) 4
- D)  $\pm 12$

28. Find the value of  $k$  if the sum of the reciprocal of the roots of the equation  $25x^2 - kx + 9 = 0$  is 10.

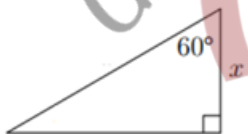
- A) 44
- B) 90
- C) 12
- D) None of these

29. The value of

$\left(\frac{1}{3} \log_{10} 125 - 2 \log_{10} 4 + \log_{10} 32\right)$  is:

- A) 40
- B)  $\frac{4}{5}$
- C) 1
- D) 2

30. The area of the triangle shown is  $50\sqrt{3}$  square units. Find the perimeter.



- A)  $10(3 - \sqrt{3})$
- B)  $10(3 + \sqrt{3})$
- C)  $30\sqrt{3}$
- D) None of these



31. Ratio of sides of a rectangle are 2:3, the perimeter is 40. Find the area

- A) 96
- B) 100
- C) 120
- D) Cannot be determined

32. Area of a rectangle is 120 while perimeter is 46. Find the diagonal.

- A) 8
- B) 17
- C) 20
- D) Cannot be determined

33. Three cubes of a metal, whose edges are 3 cm, 4 cm and 5 cm respectively, re melted into a single cube. The edge of the new cube is:

- A) 4 cm
- B) 6 cm
- C)  $5\sqrt{2}$  cm
- D) 12 cm

34. The centre and radius of the circle having an equation  $2x^2 + 2y^2 - 6x + 10y = 1$  is

- A)  $(\frac{1}{2}, \frac{3}{2}), 3$
- B)  $(\frac{3}{2}, -\frac{5}{2}), 9$
- C)  $(\frac{3}{2}, \frac{3}{2}), 3$
- D)  $(\frac{3}{2}, -\frac{5}{2}), 3$

35. Line l in the xy-plane contains points from each of Quadrants II, III and IV, but no points from Quadrant I. Which of the following must be true?

- A) The slope of line A is undefined.
- B) The slope of line A is zero.
- C) The slope of line A is positive.
- D) The slope of line A is negative.

36. If  $f(2)=5$  and  $f(5)=10$ , what will be the gradient of the function?

- A) 1.67
- B) 1.5
- C) 2.5
- D) None of these.

37. If  $f(x) = \frac{x-1}{x+1}$  then  $f^{-1}(x) = \underline{\hspace{2cm}}$ .

- A)  $\frac{x-1}{x+1}$
- B)  $\frac{x+1}{x-1}$
- C)  $\frac{-1}{f(x)}$
- D)  $\frac{1}{f(x)}$

38. Find the vertex of the parabola with the  $f(x) = x^2 - 10x + 28$  equation:

- A) 5,-3
- B) 5,3
- C) -3,5
- D) 3,5

39. The domain of function  $f$  defined by,

$f(x) = \frac{\sqrt{x^2-4x}}{\sqrt{x(x-1)}}$  is the set of all values of  $x$  given by

- A)  $(-\infty, 0) \cup [4, \infty)$
- B)  $(-\infty, -1) \cup [1, \infty)$
- C)  $(-\infty, -1) \cup [4, \infty)$
- D)  $(-\infty, 0) \cup (4, \infty)$

40. Which of the following points lies below the line  $9x + y - 6 = 0$

- A) (0.5, 0)
- B) (1, -3)
- C) (2,4)
- D) None of the above.

41. For what values of 'k' will the pair of equations  $x + 2y = k$  and  $3x - ky = -18$  not have a unique solution?

- A) -2
- B) 6
- C) -6
- D) 7

42. A father has 8 children. He takes them 3 at a time to the zoo as often as he can without taking the same 3 children more than once. How often will he go, and how often will each child go?

- A) 56 ; 21
- B) 21 ; 56
- C) 56 ; 9
- D) 9 ; 56

43. If  ${}^nC_8 = {}^nC_{12}$  then  $n =$

- A) 20
- B) 4
- C) 8
- D) 12

44. Two cards are drawn at random without replacement. The probability that the first is a king and second is not a king is

- A)  $\frac{48}{663}$
- B)  $\frac{24}{663}$
- C)  $\frac{12}{663}$
- D) None of these

45. Three coins are tossed simultaneously, the probability of obtaining more than one head is

- A) 1
- B)  $\frac{1}{8}$
- C)  $\frac{1}{2}$
- D)  $\frac{7}{8}$