In 2018 E.C at Injibara sub city administration Education office
Mathematics Model examination for Grade 12 students

Time allowed: 1:30 hrs.

I. Choose the correct answer from the given alternatives

1. If $x=2.4\times10^{-4}$ and $y=12\times10^{-6}$,then the scientific notation of $\frac{x}{y}$ is_____.

   A. 2×10^{2} $B.2\times10^{-1}$ C. 4×10 C. D. 0.2×10

   Answer:C

2. The solution set of the equation $|5x+1|=2x+10$ is

   A. $\{-\frac{11}{7},-3\}$ B. $\{3\}$ C. $\{\frac{-11}{7}\}$ D. $\{\frac{11}{7}, 3\}$

   Answer:A

3. If $x^2+kx+k=0$,then what is the value of k if it has one real root?

   A. 0 or -4 1 B. 0 or k C. -4 D. -2 or 2

   Answer:B

4. Let A∩B= {1, 2, 3}, and A∪$B=\{-2,-1,0,1,2,3,4\}$, then AΔB is equal to _____.

   A. {1, 2, 3} B. {-2, -1, 0, 4} C. {-2,-1,0,1,2,3,4} D. {-2,-1,4}

   Answer:B

5. The minimum value of the function $f(x)=5x^2+10x+3$ is A. -1 B. 2 C.-2 D. 1

   Answer:C

6. The polynomial function $f(x)=x^5+3x^4-2x^3+2$ is divided by x-1 ,then what is the reminder A. 4 B. 1 C. 6 D. -4

   Answer:A

7. If $2(3^x)=3(2^x)$, then the value of x is ____. A. 4 B. 2 C. 1 D. 3

   Answer:C

8. If $\log x+\log(x+15)=2$, then what is its solution set?

   A. {-20, 5} B. {-20, -5} C. {5} D. {-20}

   Answer:C

9. If x amount of money is invested at the rate of 10% compounded semi annually. How long does it take to double the initial investment? (Use $\log 2=0.301$, $\log 1.1=0.0414$, $\log 1.05=0.0212$) A. 14.2 B. 3.6 D. 8.3 D. 7.1

   Answer:D

10. Which of the following point lies on y-axis? A. (0,3) B. (3,3) C. (3,0) D. (-3,3)

    Answer:A

11. If the line segment $\overline{AB}$ with the points A(5,3) and B(-4,6) , then which of the following point divides AB internally in the ratio of 1:2 ? A. (4,2) B. (2,4) C. $(-4,2)$ D. (-2,4)

Answer:B

12. The equation of a line passing through points p (2,-3) and q (-1, 6) is ____.

A. $y=-3x-3$ B. $y=-3x+3$ C. $y=-3x-6$ D. $y=-3x+6$

Answer:B

13. The area of a regular hexagon of side length 6cm is _____.

A. $54\sqrt{3}cm^2$ B. $54cm^2$ C. $9\sqrt{3}cm^2$ D. $108\sqrt{3}cm^2$

Answer:A

14. Find the volume of a right circular cone of radius 4cm and its slant height is 5cm.

A. $16\pi cm^3$ B. $\frac{80}{3}\pi cm^3$ C. $4\pi cm^3$ D. $\frac{20}{3}\pi cm^3$

Answer:A

15. Find the area of the region enclosed b/n the graph of $f(x)=x^2-1$,the x-axis and the y-axis in the interval [0,3]. A. $\frac{18}{3}$ B. $\frac{22}{3}$ C. $\frac{20}{3}$ D. $\frac{20}{3}$

Answer:B

16. What is the area of the sector with radius 10cm and angle $\theta=90^0$?

A. $100\pi cm^2$ B. $25\pi cm^2$ C. $50\pi cm^2$ D. $5\pi cm^2$

Answer:B

17. Which one of the following is a function?

A. $f(x)=x^2+3x+1$ B. {(1,2) ,(2,2) ,(3,2)} C. {(1,2) ,(1,4) ,(1,3)} D. {(3,1), (2,1), (2,3)}

Answer:B

18. Which one of the following ist true about the rational function $f(x)=\frac{1+x^2}{x^2+x-2}$?

A. the graph crosses the x-axis B. the graph doesn't cross the y-axis C. the graph crosses the horizontal asymptote at (3, 1) D. the vertical asymptote of f is x=-1 and x=2

Answer:C

19. The simplified form of $f(x)=\frac{x^2-y^2}{2x+2y}$ is A. 2(x-y) B. $\frac{x-y}{2}$ C. $\frac{y-x}{2}$ D. $\frac{x+y}{2}$

Answer:B

20. Let A be 3×3 matrix, if $|A|=5$ then $|2A|$ is equal to : A. 10 B. -10 C. 40 D. 30

Answer:C

21. If $A=\begin{bmatrix}1 & 2\\ 1 & 3\end{bmatrix}$, then $A^{-1}=$¿¿ A. $\begin{bmatrix}1 & 1\\ 2 & 3\end{bmatrix}$ B. $\begin{bmatrix}3 & 2\\ 1 & 1\end{bmatrix}$ C. $\begin{bmatrix}3 & -2\\ -1 & 1\end{bmatrix}$ D. $\begin{bmatrix}1 & -1\\ -2 & 3\end{bmatrix}$

Answer:C

22. The reflection of the line p (3, 6) in the line y=-x is ____.
A. (6, 3) B. (6,-3) C. (-6, 3) D. (-6,-3)

Answer:D

23. The 7^{th} term of an A.P is 28 and the 13^{th} term is 46, then the 1^{st} term is _____.
A. 3 B. 10 C. 38 D. -10

Answer:B

24. What is the sum of all three digit numbers b/n 100 and 200 which are divisible by 3?
A. 1133 B. 301 C. 3311 D. 15000

Answer:C

25. If the Geometric progression has $G_{10}=5 \wedge G_{15}=160$, then the first term (G1) is _____.
A. $\frac{-512}{5}$ B. $\frac{-5}{512}$ C. $\frac{512}{5}$ D. $\frac{5}{512}$

Answer: D

26. Let $f(x)=x^2\sqrt{x}$, then $f'(1)$ is equal to A. $\frac{5}{2}$ B. $\frac{2}{5}$ C. 1 D. does not exist at x=1

Answer:A

27. If $f(2)=3$ and $f'(2)=5$, then the equation of tangent line to the graph of f(x) at x=2 is _____. A. $y=5x+7$ B. $y=-5x-7$ C. $y=-5x+7$ D. $y=5x-7$

Answer:D

28. If the data is 3, 2, 7, 4, 6, 9, 7, then he mean deviation about the mode is _____.

A. 7 B. $\frac{16}{7}$ C. $\frac{15}{7}$ D. 2

Answer:C

29. Find the minimum value of the function Z=50x+40y subject to $\{3x+2y \geq 18$

A. 300 B. 360 C. 230 D. 0

Answer:A

30. Alemu bought a quintal of Teff at birr 10000 with 30% mark up on cost price. What is the selling price? A. 11500 B. 13000 C. 15000 D. 13650

Answer:B