## MOCK TEST PAPER -3

1. If $x=-0.5$, then which of the following has the smallest value?
A. $2^{\frac{1}{x}}$
B. $\frac{1}{x}$
C. $\frac{1}{x^{2}}$
D. $2^{x}$
E. $\frac{1}{\sqrt{-x}}$
2. Which among, $2^{\frac{1}{2}}, 3^{\frac{1}{3}}, 4^{\frac{1}{4}}, 6^{\frac{1}{6}}, 12^{\frac{1}{12}}$ is the largest?
A. $2^{\frac{1}{2}}$
B. $3^{\frac{1}{3}}$
C. $4^{\frac{1}{4}}$
D. $6^{\frac{1}{6}}$
E. $12^{\frac{1}{12}}$
3. If $\frac{a}{b}=\frac{1}{3}, \frac{b}{c}=2, \frac{c}{d}=\frac{1}{2}, \frac{d}{e}=3$ and $\frac{e}{f}=\frac{1}{4}$ then what is the value of $\frac{a b c}{d e f}$
A. $\frac{3}{8}$
в. $\frac{27}{8}$
C. $\frac{3}{4}$
D. $\frac{27}{4}$
E. $\frac{1}{4}$
4. The length, breadth and height of a room are in the ratio $3: 2: 1$. If the breadth and height are halved while the length is doubled, then the total area of the four walls of the room will
A. Remains the same
B. Decrease by $13.64 \%$
C. Decrease by $15 \%$
D. Decrease by $18.75 \%$
E. Decrease by $30 \%$
5. Consider a sequence where the nth term, $t_{n}=\frac{n}{n+1},=1,2, \ldots \ldots$. The value of $t_{3} \times t_{4} \times t_{5} \times t_{6} \times \ldots \ldots \ldots . \times t_{53}$ equals:
A.

B.

C. 55
D. $\frac{1}{1485}$
E. $\frac{1}{2970}$
6. A group of 630 children is arranged in rows for a group photograph session. Each row contains three fewer children than the row in front of it. What number of rows is not possible?
A. 3
B. 4
C. 5
D. 6
E. 7
7. What are the values of $x$ and $y$ that satisfy both the equations?
$2^{0.7 x} \times 3^{-125 y}=\frac{8 \sqrt{6}}{27}$
$4^{03 x} \times 9^{02 y}=8 \times(81)^{\frac{1}{5}}$
A. $x=2, y=5$
B. $x=2.5, y=6$
C. $x=3, y=4$
D. $x=3, y=5$
E. $x=5, y=2$
8. The number of solutions of the equation $2 x+y=40$ where both $x$ and $y$ are positive integers and $x \leq y$ is:
A. 7
B. 13
C. 14
D. 18
E. 20
9. A survey was conducted of 100 people to find out whether they had read recent issues of Golmal, a monthly magazine. The summarized information regarding readership in 3 months is given below:

| Only September | 18 |
| :--- | :---: |
| September but <br> Not August | 23 |
| September and <br> July <br> September | 8 |
| July | 28 |
| July and August | $\mathbf{4 8}$ |
| None of the three <br> Months | 24 |

What is the number of surveyed people who have read exactly two consecutive issues (out of the three)?
A. 7
B. 9
C. 12
D. 14
E. 17
10. The sum of four consecutive two digit odd numbers, when divided by 10 , becomes a perfect square. Which of the following can possibly be one of these four numbers?
A. 21
B. 25
C. 41
D. 67
E. 73
11. The graph of $y-x$ against $y+x$ is as shown below. Then, which of the options given shows the graph of $y$ against x .


12. Consider the set $S=\{1,2,3, \ldots, 1000\}$. How many arithmetic progressions can be formed from the elements of $S$ that start with 1 and end with 1000 and have at least 3 elements?
A. 3
B. 4
C. 6
D. 7
E. 8

## Directions for questions 13 to 14

A punching machine is used to punch a circular hole of diameter two units from a square sheet of aluminum of width 2 units, as shown below. The hole is punched such that the circular hole touches one corner $P$ of the square sheet and the diameter of the hole originating at $P$ is in line with a diagonal of the square

13. The proportion of the sheet area that remains after punching is:
$\frac{\pi+2}{8}$
A.
$\frac{6-\pi}{8}$
c. $\frac{4-\pi}{4}$
D.

E.
$\pi-2$
14. Find the area of the part of the circle (round punch) falling outside the square sheet.
A. $\frac{\pi}{4}$
B. $\frac{\pi-1}{2}$
C. $\frac{\pi-1}{4}$
D. $\frac{\pi-2}{2}$
$=\frac{\pi-2}{4}$
15. What values of x satisfy $x^{\frac{2}{3}}+x^{\frac{1}{3}}-2 \leq 0$
A. $-8 \leq x \leq 1$
B. $-1 \leq x \leq 8$
C. $1<x<8$
D. $1 \leq x \leq 8$
E. $-8 \leq x \leq 8$
16. Let $f(x)=\max (2 x+1,3-4 x)$, where x is any real number. Then the minimum possible value of $(\mathrm{x})$ is:
A. $1 / 3$
B. $1 / 2$
C. $2 / 3$
D. $4 / 3$
E. $5 / 3$

## Directions for questions 17 and 18

17. What is the weight of Praja's luggage?
A. 20 kg
B. 25 kg
C. 30 kg
D. 35 kg
E. 40 kg
18. What is the free luggage allowance?
A. 10 kg
B. 15 kg
C. 20 kg
D. 25 kg
E. 30 kg
19. Arun, Barun and Kiranmala start from the same place and travel in the same direction at speeds of $30 \mathrm{~km} / \mathrm{hr}, 40$ $\mathrm{km} / \mathrm{hr}$ and $60 \mathrm{~km} / \mathrm{hr}$ respectively. Barun starts two hours after Arun. If Barun and Kiranmala overtake Arun at the same instant, how many hours after Arun did Kiranmala start?
A. 3 hrs
B. 3.5 hrs
C. 4 hrs
D. 4.5 hrs
E. 5 hrs
20. When you reverse the digits of the number 13, the number increases by 18 . How many other two digit numbers increase by 18 when their digits are reversed?
A. 5
B. 6
C. 7
D. 8
E. 10
21. A semicircle is drawn with $A B$ as its diameter. From $C$, a point on $A B$, a line perpendicular to $A B$ is drawn meeting the circumference of the semicircle at $D$. Given that $A C=2 \mathrm{~cm}$ and $C D=6 \mathrm{~cm}$, the area of the semicircle (in sq. cm.) will be:
A. ${ }^{32 \pi}$
B. ${ }^{50 \pi}$
c. ${ }^{40.5 \pi}$
D. ${ }^{81 \pi}$
E. Cannot be determined
22. There are 6 tasks and 6 persons. Task 1 cannot be assigned either to person 1 or to person 2 ; task 2 must be assigned to either person 3 or person 4. Every person is to be assigned one task. In how many ways can the assignment be done?
A. 144
B. 180
C. 192
D. 360
E. 716
23. The number of employees in Obelix Menhir Co. is a prime number and is less than 300 . The ratio of the number of employees who are graduates and above, to that of employees who are not, can possibly be:
A. $101: 88$
B. $87: 100$
C. $110: 111$
D. $85: 98$
E. $97: 84$
24. If $\log _{y} x=a \cdot \log _{z} y=b \cdot \log _{x} z=a b$
A.

2, $\frac{1}{2}$
B. 1,1
$\pi, \frac{1}{\pi}$
D. $0.4,2.5$
E. 2, 2
25. An equilateral triangle $B P C$ is drawn inside a square $A B C D$. What is the value of the angle $A P D$ in degrees?
A. 75
B. 90
C. 120
D. 135
E. 150


