

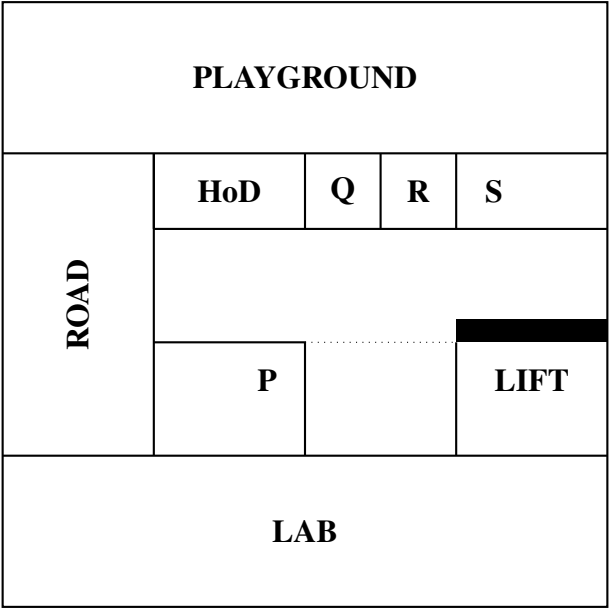
2020-CE-'53-65'

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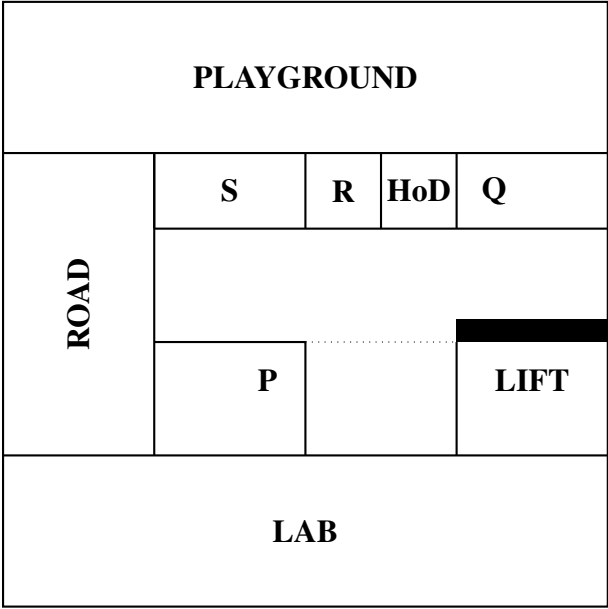
- 1) A gaseous chemical has a concentration of $41.6 \mu\text{mol}/\text{m}^3$ in air at 1 atm pressure and temperature 293 K. The universal gas constant is $82.05 \times 10^{-3} \text{ m}^3 \cdot \text{atm}/(\text{mol} \cdot \text{K})$. Assuming the ideal gas law is valid, the concentration of the gaseous chemical (in ppm, round off to one decimal place) is _____.
- 2) A stream with a flow rate of $5 \text{ m}^3/\text{s}$ is having an ultimate BOD of 30 mg/litre. A wastewater discharge of $0.2 \text{ m}^3/\text{s}$ having BODs of 500 mg/litre joins the stream at a location and instantaneously gets mixed up completely. The cross-sectional area of the stream is 40 m^2 which remains constant. BOD exertion rate constant is 0.3 per day (logarithm base to e). The BOD (in mg/litre, round off to two decimal places) remaining at 3 km downstream from the mixing location, is _____.
- 3) The lengths and bearings of a traverse PQRS are given as follows:

Segment	Length (m)	Bearing
PQ	40	80°
QR	50	10°
RS	30	210°

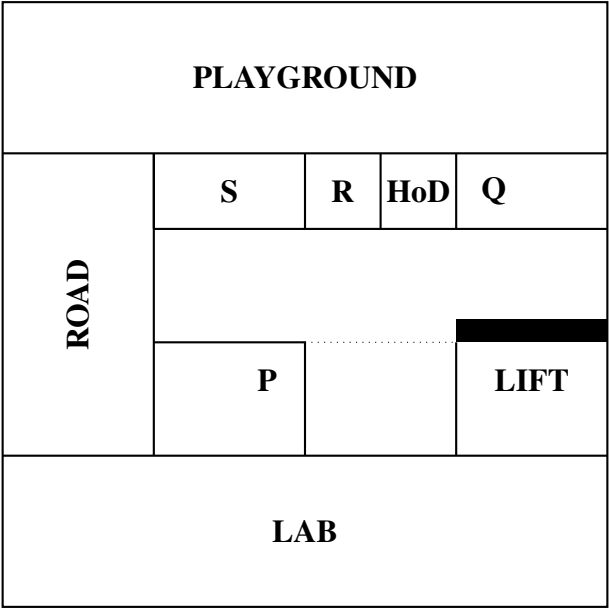
- The length of line segment SP (in m, round off to two decimal places), is _____.
- 4) Rescue teams deployed _____ disaster-hit areas combat _____ a lot of difficulties to save the people.
 - a) with, at
 - b) in, with
 - c) with, with
 - d) to, to
 - 5) Select the most appropriate word that can replace the underlined word without changing the meaning of the sentence:
 Nowadays, most children have a tendency to belittle the legitimate concerns of their parents.
 - a) disparage
 - b) applaud
 - c) reduce
 - d) begrudge
 - 6) Select the word that fits the analogy:
 Partial : Impartial :: Popular : _____
 - a) Impopular
 - b) Dispopular
 - c) Mispopular
 - d) Unpopular
 - 7) After the inauguration of the new building, the Head of the Department (HoD) collated faculty preferences for office space. P wanted a room adjacent to the lab. Q wanted to be close to the lift. R wanted a view of the playground. S wanted a corner office.



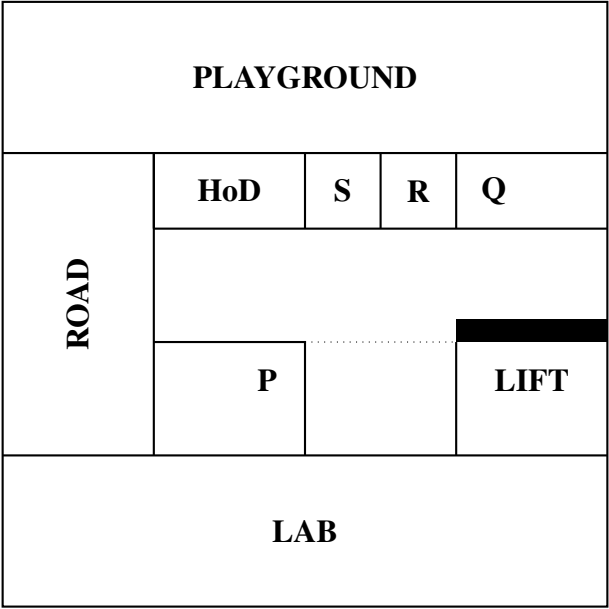
a)



b)



c)



d)

- 8) If $f(x) = x^2$ for each $x \in (-\infty, \infty)$, then $\frac{f(f(f(x)))}{f(x)}$ is equal to:
- a) $f(x)$
 - b) $(f(x))^2$
 - c) $(f(x))^3$
 - d) $(f(x))^4$

Q6-Q10 CARRY TWO MARKS EACH.

- 9) Nominal interest rate is defined as the amount paid by the borrower to the lender for using the borrowed amount over a specific period of time. Real interest rate calculated on the basis of actual value(inflation-adjusted), is approximately equal to the difference between the nominal rate and the expected rate of inflation in the economy.
Which of the following assertions is best supported by the above information?
- a) Under high inflation, real interest rate is low and borrowers get benefited.
 - b) Under low inflation, real interest rate is high and borrowers get benefited.
 - c) Under high inflation, real interest rate is low and lenders get benefited.
 - d) Under low inflation, real interest rate is low and borrowers get benefited.
- 10) For the year 2019, which of the previous year's calendar can be reused?
- a) 2011
 - b) 2012
 - c) 2013
 - d) 2014
- 11) The ratio of 'the sum of odd positive integers from 1 to 100' to 'the sum of even positive integers from 150 to 200' is _____.
- a) 45:95
 - b) 1:2
 - c) 50:91
 - d) 1:1
- 12) In a school of 1000 students, 300 students play chess, 600 students play football. If 50 students play both chess and football, the number of students who play neither is _____.
- a) 200
 - b) 150
 - c) 100
 - d) 50
- 13) The monthly distribution of 9 Watt LED bulbs sold by two firms X and Y from January to June 2018 is shown in the pie-chart and corresponding table. If the total number of LED bulbs sold during April-June 2018 is 50,000, then the number of LED bulbs sold by the firm Y during April-June 2018 is _____

Month	Ratio of LED bulbs sold by two firms (X:Y)
January	7:8
February	2:3
March	2:1
April	3:2
May	1:4
June	9:11

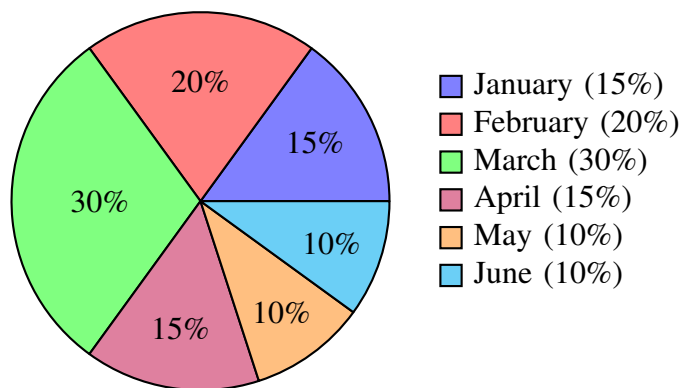


Fig. 13.1. Percentage of 9 Watt LED bulbs sold by the firms X and Y from January 2018 to June 2018