BYJU'S EXAM PREP

GATE 2018

Electrical Engineering

General Aptitude

Question Paper & Solutions

1. For what values of k given below is $\frac{(k+2)^2}{k-3}$ an integer?

A. 4, 8, 18 B. 4, 10, 16

C. 4, 8, 28 D. 8, 26, 28

[2018 : 1 Mark]

Ans. C

Sol.

$$\left.\begin{array}{l} K=4 \Rightarrow \frac{(4+2)^2}{4-3}=36 \\ K=8 \Rightarrow \frac{(8+2)^2}{8-3}=\frac{100}{5}=20 \\ K=28 \Rightarrow \frac{(28+2)^2}{28-3}=\frac{900}{25}=36 \end{array}\right\} \text{integers}$$

So, option (C) ⇒ 4, 8, 28

2. The three roots of the equation f(x) = 0 are x = {−2, 0, 3}. What are the three values of x for which f(x − 3) = 0?

A. −5, −3, 0 B. −2, 0, 3

C. 0, 6, 8 D. 1, 3, 6

[2018 : 1 Mark]

Ans. D

Sol. f(x) = 0

x = {−2, 0, 3}

f(−2) = 0, f(0) = 0 f(3) = 0

f(x − 3) = 0

1, 3, 6

f(1 − 3) = f(−2) = 0

f(3 − 3) = f(0) = 0

f(6 − 3) = f(3) = 0

3. Functions, F(a, b) and G(a, b) are defined as follows:

$F(a, b) = (a - b)^2$ and G(a, b) = |a − b|, where |x| represents the absolute value of x. What would be the value of G(F(1, 3) G(1,3))?

A. 2 B. 4

C. 6 D. 36

[2018 : 1 Mark]

Ans. A

Sol. $F(a, b) = (a - b)^2$

$G(a, b) = |a - b|$

$G(F(1, 3)\ G(1, 3) = G((1 - 3)^2, |1 - 3|)$

$= G(4, 2)$

$= |4 - 2| = 2$

4. An e-mail password must contain three characters. The password has to contain one numeral from 0 to 9, one upper case and one lower case character from the English alphabet. How many distinct passwords are possible?

A. 6,760 B. 13,520

C. 40,560 D. 1,05,456

[2018 : 2 Marks]

Ans. C

Sol. Numerical can be selected in 10 ways (0 – 9). Each of upper case and lower-case alphabets can be done in 26 ways each.

All three chosen (1 numeral and 2 alphabet) can be arranged in 3! ways.

So, total number of ways will be $10 \times 26 \times 26 \times 3! = 40560$ ways

5. A designer uses marbles of four different colours for his designs. The cost of each marble is the same, irrespective of the colour. The table below shows the percentage of marbles of each colour used in the current design. The cost of each marble increased by 25%. Therefore, the designer decided to reduce equal numbers of marbles of each colour to keep the total cost unchanged. What is the percentage of blue marbles in the new design?

Blue	Black	Red	Yellow
40%	25%	20%	15%

A. 35.75 B. 40.25

C. 43.75 D. 46.25

[2018 : 2 Marks]

Ans. C

Sol. Assume number of marbles = 100

Cost of marbles increased =25

New cost =Rs. 125

Number of marbles in Rs. 100

$= \frac{100}{125} \times 100 = 80$ marbles

Now, (40 – x) + (20 – x) + (15 – x) = 80

100 – 4x = 80

x = 5

% blue marbles in new design

$= \frac{(40-5)}{80} \times 100$

$= 35 \times \frac{5}{4} = 43.75\%$

6. A class of twelve children has two more boys than girls. A group of three children are randomly picked from this class to accompany the teacher on a filed trip. What is the probability that the group accompanying the teacher contains more girls than boys?

A. Zero

B. $\frac{325}{864}$

C. $\frac{525}{864}$

D. $\frac{5}{12}$

[2018 : 2 Marks]

Ans. B

Sol. B + G = 12

B = G + 2

$\Rightarrow$ B = 7

G = 5

7 Boys and 5 Girls are there is 12 students. Among 3 students selected boys have to be more than girls. So only two cases arise.

G	B
2	1
3	0

As case (i),

$GGG \rightarrow \frac{5}{12} \times \frac{5}{12} \times \frac{5}{12}$

Case (ii),

$\left.\begin{matrix} G & G & B \\ G & B & G \\ B & G & G \end{matrix}\right\} \rightarrow 3 \times \frac{5}{12} \times \frac{5}{12} \times \frac{7}{12}$

Required prob.

$$\left(\frac{5}{12}\right)^3 + 3\left(\frac{5}{12}\right)^2 \times \left(\frac{7}{12}\right)$$

$$= \frac{650}{1728} = \frac{325}{864}$$

$$= 0.3761574 \gg 0.376$$

Method-2:

There are 7B and 5G

Through as question is stating 3 students are taken at random.

This can be possible way to approach it.

G	B
2	1
3	0

$$\frac{{}^5C_2 + {}^7C_1 + {}^5C_3 + {}^7C_0}{{}^{12}C_3} = \frac{10 \times 7 + 10 \times 1}{\frac{12 \times 10 \times 11}{6}} = \frac{80}{220}$$

$$\frac{4}{11} \approx 0.3636$$

7. In a certain code AMCF is written as EQGJ and NKUF is written as ROYJ. How will DHLP be written in the code?

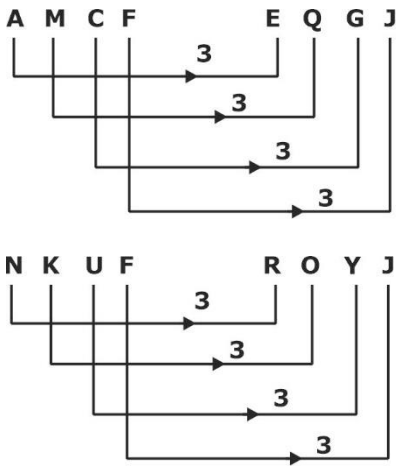
A. RSTN B. TLPH

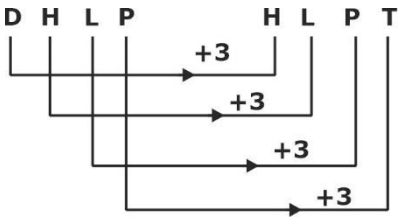
C. HLPT D. XSVR

[2018 : 2 Marks]

Ans. C

Sol.





8. P, Q, R and S crossed a lake in a boat that can hold a maximum of two persons, with only one set of oars. The following additional facts are available:

(i) The boat held two persons on each of the three forward trips across lake and one person on each of the two return trips.

(ii) P is unable to row when someone else is in the boat.

(iii) Q is unable to row with anyone else except R.

(iv) Each person rowed for at least one trip.

(v) Only one person can row during a trip.

Who row twice?

A. P B. Q

C. R D. S

[2018 : 2 Marks]

Ans. C

Sol. (i) Q and R moves first.

In forward trip Q rowed.

In return trip R rowed.

(ii) P and R moves in second trip

R rowed in forward trip

P rowed in return trip

(iii) P and S moves in last trip

S rowed in forward trip.

R rowed twice.

9. "Since you have gone off the _____, the _____ sand is likely to damage the car". The words that best fill the blanks in the above sentence are

A. course, coarse B. course, course

C. coarse, course D. coarse, coarse

[2018 : 1 Mark]

Ans. A

Sol. Going off the course – not following the intended route.

Coarse sand – harsh in texture.

Hence, option A is correct.

10. "A common misconception among writers is that sentence structure mirrors thought; the more _____ the structure' the more complicated the ideas". The word that best fills the blank in the above sentence is

A. detailed B. simple

C. clear D. convoluted

[2018 : 1 Mark]

Ans. D

Sol. Because the second half of the sentence illustrates the idea that "structure mirrors thought," any word that fills the blank must be similar in meaning to "convoluted." The two words that are similar to "convoluted" are "complicated" and "involved", which produce sentences alike in meaning. "Fanciful," while somewhat similar in meaning to "convoluted," is not as similar to either "complicated" or "involved" as those words are to each other. The other answer choices are not similar in meaning to "convoluted," and thus do not produce coherent sentences. Thus the correct answer is complicated.