

Comprehensive Test Series-07
P & C (7), straight line (10)

TIME: 2.30 hr.

MM: 64

General Instructions:

- All Questions are compulsory.
- Marks are given alongwith the questions individually.
- Use of calculator is not permitted.

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- Q.1 A coin is tossed 3 times and the outcomes are recorded. How many possible outcomes are there? (3)
- Q.2 In how many ways can 5 persons sit in a car, 2 including the driver in the front seat and 3 in the back seat, if 2 particular persons out of the 5 are to avoid the driver seat? (3)
- Q.3 Show that $26!$ is divisible by 2^{10} . (3)
- Q.4 Determine n if ${}^{2n}C_3 : {}^nC_3 = 11:1$ (3)
- Q.5 In how many ways can one select a cricket team of eleven from 17 players in which only 5 players can bowl if each cricket team of 11 must include exactly 4 bowlers? (3)
- Q.6 A question paper has two parts A and B each containing 10 questions. If a student has to choose 8 from part A and 4 from part B, in how many ways can he choose the questions. (3)
- Q.7 In how many ways words with or without meaning can be formed with the letter of the word EQUATION so that the vowels and consonants occur together? (3)
- Q.8 A number lock on a suitcase has 3 wheels each labeled with 10 digits from 0 to 9. If opening of the lock is a particular sequence of three digits with no repeats, how many such sequences will be possible? (3)
- Q.9 Find the angle between the lines $y - \sqrt{3}x - 5 = 0$, $\sqrt{3}y - x + 6 = 0$. (3)
- Q.10 Find the distance between the parallel lines $3x - 4y + 7 = 0$ and $3x - 4y + 5 = 0$. (3)
- Q.11 If p and q are the lengths of perpendiculars from the origin to the lines $x \cos \theta - y \sin \theta = k \cos 2\theta$ and $x \sec \theta + y \csc \theta = k$, respectively, prove that $p^2 + 4q^2 = k^2$ (4)
- Q.12 If p is the length of perpendicular from the origin to the line whose intercepts on the axes are a and b , then show that $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$. (3)
- Q.13 Find the equations of the lines, which cut-off intercepts on the axes whose sum and product are 1 and -6, respectively. (3)

- Q.14 Prove that the product of the lengths of the perpendiculars drawn from the points $(\sqrt{a^2 - b^2}, 0)$ and $(-\sqrt{a^2 - b^2}, 0)$ to the line $\frac{x}{a} \cos \theta + \frac{y}{b} \sin \theta = 1$ is b^2 . (4)
- Q.15 Find the image of the point $(3, 8)$ with respect to the line $x + 3y = 7$ assuming the line to be a plane mirror. (3)
- Q.16 If three points $(a, 0)$, $(0, b)$ and $(1, 1)$ lie on a line, show that $\frac{1}{a} + \frac{1}{b} = 1$ (3)
- Q.17 $P(a, b)$ is the mid-point of a line segment between the axes. Show that the equation of the line is $\frac{x}{a} + \frac{y}{b} = 2$. (3)
- Q.18 Point (h, k) divides a line segment between the axes in the ratio $1:2$. Find the equation of the line (3)
- Q.19 Without using the Pythagorean theorem show that the points $(4, 4)$, $(3, 5)$ and $(-1, -1)$ are the vertices of a right-angled triangle. (3)
- Q.20 Find the equations of the lines passing through the point $(3, 4)$ such that the sum of their intercepts on the axes is 14 . (4)