Section-B

Note: Solve any TEN of the following questions.

Q.2 State the De-Morgan's law verify De-Morgan's law when U = The set of the english alphabets.
A = { x |x is a vowel} B={ x|x is a consonant}

Q.4 Drive the Quadratic Formula standard form of qudratic equation is $ax^2 + bx + c = 0$

Q.5 Solve the equation $2^2x - 3.2^{x+2} + 32 = 0$

Q.6 When $x^4 + 2x^3 + kx^2 + 3$ is divided by x - 2, the remainder is 1 Find the value of k.

Q.7 Find the sum to 10 terms of an A.P whose 4th term is 7 and 7th term is 13

Q.8 Prove that ${}^{n}C_r + {}^{n}C_{r-1} = {}^{n+1}C_r$

Q.9 A pair is to be chosen form a group fo 4 boys and 3 girls Find the probability that the pair consists of one boy and one girl

Q.10 Prove by mathematical induction $a^n - b^n$ is divisible by a a + b for $n \in N$

Q.11 Show that $(R - \{-1\}, *)$ is a group where * is defined on a a * b = a + b + ab

Q.12 An arc subtends an angle of 70° at the center of a circle and its length is 132 mm Find the radius of the circle.

Q.13 Solve the equation $2^{2x} - 3.2^{x+2} + 32 = 0$

Q.14 When $x^4 + 2x^3 + kx^2 + 3$ is divided by x - 2, the remainder is 1. Find the value of k

Section-C

Note: Solve any THREE of the following questions. Each question carries 10(6 + 4) marks.

Q.15 (a)A geometric progression, for which the common ratio is positive , has a second term of 18 a fourth term of 8. Find the sum ot infinity of progression

(b) If there are 3 children in family, what is the probability taht the third child is a girl. and the t wo children are boys and one child is girl?

Q.16 (a) Solve: $\sqrt{x^2 - 3x + 9} = \sqrt{x^2 - 3x + 36} - 3$

(b) Express the recurring decimal 1,428 as a common fraction.

Q.17 (a) If $Z = \frac{1}{3} + \frac{13}{3.6} + \frac{13}{3.6.7} + \frac{13.5.7}{3.6.9.12} + \ldots$ prove that $Z^2 + 2Z - 2 = 0$

(b) Show that : $\frac{1}{r^2} + \frac{1}{r_1^2} + \frac{1}{r_2^2} + \frac{1}{r_3^2} = \frac{a^2 + b^2 + c^2}{\Delta^2}$

Q.18 (a) Solve the system of equations: $2x^2 + xy + y^2 = 8, 6xy + 2y^2 = 20$

(b) Solve $5^{\sin x + \cos x} = 1$