Note:-
      1. All Questions are compulsory.
      2. Numbers on the right indicate full marks.

Section A

Q.1. **Select and write the correct answer.** **(4)**

  1.
Let $0 < A, B < \dfrac{\pi}{2}$ satisfying the equation $3\sin^2 A + 2 \sin^2 B = 1$ and $3 \sin^2 A - 2\sin^2 B = 0$ then A + 2B is equal to ....

    A) π B) $\dfrac{\pi}{2}$

    C) $\dfrac{\pi}{4}$ D) 2π

  2.   The value of sin (n + 1) Asin (n + 2) A + cos (n + a) A cos (n + 2) A is equal to

    A) sin A   B) cos A
    C) – cos A   D) sin2A

Q.2. **Answer the following.** **(3)**

  1.   Prove : $\dfrac{1 - \cos 2\theta}{1 + \cos 2\theta} = tan\,2\theta$

  2.   Express 2sin 4x cos 2x as a sum or difference of two trigonometric function.

  3.   Prove : cos θ + sin(270° + θ) – sin(270° – θ) + cos(180° + θ) = 0

Section B
Attempt any Four

Q.3   Find the value of the sec 240°   **(2)**

Q.4   Find the value of the tan –690°   **(2)**

Q.5   Find the values of tan 105°   **(2)**

Q.6   Find the value of the cosec 780°   **(2)**

Q.7   Find the values of cot 225°   **(2)**

Q.8   Prove : cos (x + y).cos (x – y) = $\cos^2 y - \sin^2 x$ **(2)**

Section C
Attempt any Two

Q.9   Prove : tan10° + tan 35° + tan 10°.tan35° = 1   **(3)**

Q.10   Prove : $\sqrt{3}\,\operatorname{cosec} 20° - \sec 20° = 4$ **(3)**

Q.11   Prove : 2 cosec x + cosex x = sec x cot $\left(\dfrac{x}{2}\right)$ **(3)**

Section D
Attempt any One

Q.12 Prove : $\dfrac{1}{\tan 3A - \tan A} - \dfrac{1}{\cot 3A - \cot A} = \cot 2A$ **(4)**

Q.13 Prove : $\sin 20° \sin 40° \sin 60° \sin 80° = \dfrac{3}{16}$ **(4)**