Theorem 1.1:
A Finsler manifold \( F^n \) is said to be C-2 like Finsler manifold, if the indicatric tensor \( A_{ij} \) satisfies the following condition
\[
(1.1) \quad C_{ijk} = (1/C_i)C_jC_k.
\]
Wherein
\[
(1.2) \quad g^{ij} C_{ijk} = C_i
\]
is the contracted torsion tensor.

Definition 1.2:
A Finsler manifold \( F^n \) is said to be C-reducible Finsler manifold, if the indicatric tensor \( A_{ij} \) satisfies the following condition
\[
(1.3) \quad C_{ijk} = (1/(n+1))(h_{ij}C_k + h_{ik}C_j + h_{jk}C_i).
\]
Wherein
\[
(1.4) \quad h_{ij} = g_{ij} - \lambda_{ij}
\]
is an angular metric tensor.

Definition 1.3:
A Finsler manifold \( F^n \) is said to be quasi C-reducible Finsler manifold, if the indicatric tensor \( A_{ij} \) satisfies the following condition
\[
(1.5) \quad C_{ijk} = A_{ij}C_k + A_{ik}C_j + A_{jk}C_i.
\]
Wherein \( A_{ij} \) is a symmetric indicatric tensor and satisfies the condition
\[
(1.6) \quad A_{ij} g^{ij} = A.
\]
In this regard, we have the following theorems:

Theorem 1.1:
In the quasi C-reducible Finsler manifold, if the indicatric tensor is symmetric then \((h)hv\)-torsion tensor is also symmetric with respect to last two indices.

Proof:
Interchanging the indices \( i \) and \( j \) in equation (1.5), we get
\[
(1.7) \quad C_{ijk} = A_{ij}C_k + A_{ik}C_j + A_{jk}C_i.
\]
If the indicatric tensor \( A_{ij} \) is symmetric then the equation (1.7) becomes
\[
(1.8) \quad C_{ijk} = A_{ij}C_k + A_{ik}C_j + A_{jk}C_i.
\]
From equations (1.5) and (1.8), we obtain
\[
(1.9) \quad C_{ijk} = C_{ikj}.
\]
Hence, the \((h)hv\)-torsion tensor is symmetric with respect to first two indices in the quasi C-reducible Finsler manifold.

Theorem 1.2:
Let \( F^n \) be an n-dimensional Finsler manifold with the metric tensor \( g_{ij} \), the angular metric tensor \( h_{ij} \) and \((h)hv\)-torsion tensor \( C_{ijk} \). We have the following definitions:

Definition 1.1:
A Finsler manifold \( F^n \) is said to be \((h)hv\)-torsion tensor, angular metric tensor, C-2 like, C-reducible, quasi C-reducible Finsler manifold.

Keywords: \((h)hv\)-torsion tensor, angular metric tensor, C-2 like, C-reducible, quasi C-reducible Finsler manifold.

Purpose of this paper is to study the theory of quasi C-reducible Finsler manifold. In this paper, we have obtained some important theorems on quasi C-reducible Finsler manifold.

Abstract: Purpose of this paper is to study the theory of quasi C-reducible Finsler manifold. In this paper, we have obtained some important theorems on quasi C-reducible Finsler manifold.

In the quasi C-reducible Finsler manifold, if the indicatric tensor is symmetric then \((h)hv\)-torsion tensor is also symmetric with respect to last two indices.

Proof:
Interchanging the indices \( j \) and \( k \) in equation (1.5), we get
\[
(1.10) \quad C_{ikj} = A_{ij}C_k + A_{ik}C_j + A_{jk}C_i.
\]
If the indicatric tensor \( A_{ij} \) is symmetric then the equation (1.10) becomes
\[
(1.11) \quad C_{ikj} = A_{ij}C_k + A_{jk}C_i + A_{ik}C_j.
\]
From equations (1.5) and (1.11), we obtain
\[
(1.12) \quad C_{ikj} = C_{ikj}.
\]
Hence, the \((h)hv\)-torsion tensor is symmetric with respect to last two indices in the quasi C-reducible Finsler manifold.

References

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T.S. Chauhan (Tarkeshwar Singh Chauhan) received Ph.D. and D.Sc. degrees in Mathematics from M.J.P.R.U., Bareilly in 1992 and 2008 respectively. He has been working in Maths deptt., Bareilly College, Bareilly since 1990 and now he is an Associate Professor. Under his guidance nearly 25 candidates have been awarded Ph.D. degree. Several papers and books are published in different branches in different publications under him.