PHYSICS

BOOKS - NN GHOSH PHYSICS (HINGLISH)

TERRESTRIAL MAGNETISM

Others

1. The angle of dip at a particular place where the horizontal intensity is $30Am^{-1}$ is found to be 38° . Calculate the total inte4nsity of the earth's magnetic field there.

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2. The true dip at a place is 30° . What is the apparent dip when the dip circle is turned 60° out of the magnetic meridian ?

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3. A magnetic needle is suspended by a thread at its centre and it becomes horizontal when a weight of 100mg is placed on its front end. If the pole strenght of the needle is 5Am, find the vertical intensity of the earth's field. $(g = 9.8m / s^2)$

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4. Calcualate the total induction at a place where the horizontal component is

$25 \times 10^{-6}T$, and the dip 45°

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5. The vertical component of the earth's field at a place is $40Am^{-1}$ Calculate value of H_0, if dip of the place is 30°

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6. The apparent dip at a place 30° away from the magnetic meridian is 60° Calculate the true dip at the place

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7. The apparent dips in two mutually perpendicular planes are found to be δ_1 and δ_2. Show that ture δ is related with δ_1 and δ_2 by $\cot^2\delta = \cot^2\delta_1 + \cot^2\delta_2$ [note, This is the principle of cot-method of finding true dip of a place.

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8. Considering the earth's magnetism to be due to a very powerful short magnet embedded at its centre placed with its south pole pointing north, show that, latutde (λ) of any place bears a definite relation with the dip (δ) of the place and that definite relation is $\tan\delta = 2\tan\lambda$

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9. The earth is a bg dipole of moment $64 \times 10^{22} Am^2$. Calculate the horizontal and vertical components of the earth's magnetic field at a place of latitude 30° South.

(Radius of the earth $= 6000 km$)

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10. A dip needle indicates a dip of 60° at a place. When a small magnet is placed on the horizontal line through the centre of the dip needle with its north pole pointing north at a distnace 0.2m from the needle, the dip changes to 45° . Find the magnetic moment of the magnet if the horizontal component of the earth's field is 0.2×10^{-4} tesla.

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11. The magnetic moment of a dip needle is $0.5Am^2$ and it is set at a place where dip is 60° . A weight of $0.05g$ placed 4 cm from the axle cause the needle to hum the horizontal position Calculate the value of the horizontal and vertical components of the earth's field

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12. The period of oscillation of a dip needle when vibrating in the magnetic meridian is 1.5s. In a plane at right angles to the magnetic meridian it is 2s. Find the dip of the place

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13. In an experiment of finding dip by the cot-method it is found that the apparent dips in two mutually perpendicular planes are 30° and 20° . Calculate the true dip of the place.

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14. The needle of a dip circle completes 4 oscillations in one minute while vibrating in a vertical plane at right angles to the megnetic meridian. The same needle oscillates 3 times per minute in a horizontal plane at the same place. Find the value of dip at the place

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15. A magnetic needle is suspended by a thread at its centre and it shows a dip of 60° When a weight of 20 mg is placed at its front end, the dip is reduced to 30° . If the vertical component of the earth's firld is 4×10^{-5} testa, find the pole strength of the needle .

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16. Calculate the earth's total induction (B-vector) at a place where the H-vector of the maagnetic field along the horizontal is $30Am^{-1}$.

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17. A magnet vibrating horizontally at a place where the angle of dip is 45° and the total intensity of the earth's field is $40Am^{-1}$, makes 10 oscillations that it would make per minute at another place where the dip is 60° and the total intensity $50Am^{-1}$.

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18. A dip circle is set in position after leveling and the dip is found to be α . Then it is rotated through 45° away from the magnetic meridian from this position and the dip is found to be β Show that true dip is given by

$\cot^2\delta = 2\left(\cot^2\alpha + \cot^2\beta - \sqrt{2}\cot\alpha\cot\beta\right)$

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