

RAGHUNATHPUR COLLEGE
UG 3rd Semester Internal Examination 2020
MATHEMATICS
Course Code: BMTMCCRT301
Course Title: GEOMETRY 3D & VECTOR

Full Marks: 10

Time: 45 Minutes

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

Notations and symbols have their usual meanings.

Answer any one question given below

1×10=10

1. (a) Show that $[\alpha + \beta, \beta + \gamma, \gamma + \alpha] = 2[\alpha\beta\gamma]$.

(b) A variable plane is parallel to the given plane $\frac{x}{a} + \frac{y}{b} + \frac{z}{c} = 0$, and meets the axes in A, B, C. Prove that the circle ABC lies on the cone

$$yz\left(\frac{b}{c} + \frac{c}{a}\right) + zx\left(\frac{c}{a} + \frac{a}{c}\right) + xy\left(\frac{a}{b} + \frac{b}{a}\right) = 0.$$

5+5

2. (a) Find the equation of the right circular cylinder whose guiding curve is

$$x^2 + y^2 + z^2 = 9, x - y + z = 3$$

(b) Find the angle between the vectors

$$\bar{a} = 2\hat{i} + 2\hat{j} - \hat{k} \quad \& \quad \bar{b} = 3\hat{i} + 4\hat{k}.$$

5+5

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