

Reg. No. :

Name :

**Third Semester B.Tech. (Reg./Sup./Imp.) (Including Part Time)
Degree Examination, November 2012
(2007 Admn. Onwards)**
**PT 2K6/2K6 CE/ME/EE/EC/AEI/CS/IT 301 : ENGINEERING
MATHEMATICS – II**

Time: 3 Hours

Max. Marks : 100

Instruction : Answer all questions.

1. a) Define an alternating series. Discuss the convergence of

$$1 - \frac{1}{\sqrt{2}} + \frac{1}{\sqrt{3}} + \dots \text{ to } \infty.$$

- b) Find the n^{th} derivative of $x^2 \log x$.

- c) Find the rank of $\begin{bmatrix} 4 & 2 & 1 & 3 \\ 6 & 3 & 4 & 7 \\ 2 & 1 & 0 & 1 \end{bmatrix}$.

- d) Find the Eigen values and eigen vectors of $\begin{bmatrix} 1 & 1 & 3 \\ 1 & 5 & 1 \\ 3 & 1 & 1 \end{bmatrix}$.

- e) Find the area of an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ using Green's theorem.

- f) If $\vec{F} = 3xyi - y^2j$ evaluate $\int \vec{F} \cdot d\vec{r}$ where $C : y = x^2$ from $(0, 0)$ to $(1, 2)$.

- g) Check for linearly independence of $(1, 2, 4) (2, 2, 8) (1, 0, 4)$.

- h) Show that $T : \mathbb{R}^2 \rightarrow \mathbb{R}$ given by $T(x, y) = x^2 + y^2$ is not linear transformation. (5x8)