Mr. Abhay Kumar Sethi, RGNF Fellow, SRF

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Details of the funding agency/ scheme	UGC RGNF, GOVT OF India (Letter No-F1.1-2013-14-RGNF-2013-14-SC-ORI-42425)
Title of the research topic	On Oscillatory Behaviour Of Solutions Of Second Order Functional Differential Equations
Abstract of the research work (max. 300 words)	The objective of this research work is to study the oscillatory, nonoscillatory and asymptotic behavior of the following functional differential equations of the form: 1) $[\text{r(t)}\big(x(t) + p(t)x(\tau(t))\big)']' + q(t)G\big(x(\sigma(t)) + v(t)H\big(x(\eta(t))\big) = 0$ (i). Where q(t),v(t),r(t),$\tau(t),\sigma(t),\eta(t)\epsilon$C([t$_0$,∞) R_+),p(t)ϵ C(R_+, R), G ϵ C(R , R), H ϵC(R ,R), such that xG(x) >

	$0, x H(x) > 0$ for $x \neq 0$; and $\lim\limits_{t \to \infty} \tau(t) = \infty = \lim\limits_{t \to \infty} \sigma(t) = \lim\limits_{t \to \infty} \eta(t)$ with $\tau(t) \leq t, \sigma(t) \leq t,$ $\eta(t) \leq t$ satisfying the properties $\sigma o \tau = \tau o \sigma,$ $\eta o \tau = \tau o \eta, \sigma o \, \eta = \eta o \sigma.$ (2) Considering $G(x) = x^{\beta}$ and $H(x) = x^{\gamma}$ in (i), where β and γ are the ratios of odd positive integers. An effort shall be under taken to study the oscillatory behavior of the following functional differential equations: (3) $(r(t)(x(t) + p(t)x(\tau(t)))^{\alpha})'$ $$+ q(t)\left(x^{\beta}\big(\sigma(t)\big)\right) + v(t)\left(x^{\gamma}\big(\eta(t)\big)\right)$$ $$= 0 \ (ii)$$ Where α, β, γ are ratio of odd positive integers. (5) Further we have a plan to established the oscillatory behavior of solutions of second order neutral differential equations of (i) and (ii) by using Riccati transformation technique .
Progress of the research work	During my research work I have published four research paper in different journal and some of work is going on. DST, Govt, India has approved my application for Travel support to Present one of my research paper in the 14th International Conference On Dynamical System Theory and Applications, at University of Lodz, Poland during Dec 11-14,2017
Journal publication (International)	1. A. K. Tripathy, B. Panda, **A. K. Sethi;** On oscillatory nonlinear second order neutral delay differential equations, Diff. Equ. Appl, 2, (2016), No. 2 , 247–258 2.**.** A. K. Tripathy and **A. K. Sethi;** Oscillation of sublinear and superlinear second order neutral differential equations, Int. J. Pure and Appl. Math., 113,(2017), 73-91. 3. **A. K. Sethi;** Oscillation of functional differential equation of second order , G. J. Pure and Appl. Math., 13, Number 9 (2017), 5625–5634. 4. **A. K. Sethi** and A. K. Tripathy; Riccati transformation and oscillation of superlinear second order functional differential

	equations, Proceeding of Mathematical and Numerical Aspects of Dynamical System and Analysis(2017)479-490.
Conference attended	➤ Attended "Advance Lavel Training Programme-2016" of "National Programme on Differential Equations: Theory, Methods and Applications (NPDE-TCA)" held at Indian Institute of Technology, Ropar Campus, Punjab, INDIA during 16th May, 2016 - 4th June, 2016. ➤ Attended "TEOIP Sponsored Two Days International Workshop Recent Trends in Mathematics and Applications(IWRTMA-2016)" held at Veer Surendra University of Technology, Burla, Odisha, INDIA during 1th August - 2thAugest, 2016 ➤ Attended "Advance Lavel Training Programme-2016" of "National Programme on Differential Equations: Theory, Methods and Applications (NPDE-TCA)" held at Indian Institute of Technology, Ropar Campus, Punjab, INDIA during 16th May, 2016 - 4th June, 2016. ➤ Attended and presented a paper in "82th Annual Conference of the Indian Mathematical Society" held at University of Kalyani, West Bengal, INDIA during December 27-30, 2016. ➤ Attended and presented a paper in National Conference on Mathematics and Its Applications" held at Tribhuvan University, Chitwan, Nepal during January 11-13, 2017 ➤ Attended and presented a paper in the "14th International Conference On Dynamical Systems Theory and Applications " held at Lodz University, Lodz, Poland, during December 11-14, 2017. ➤
Awards	1. **Awarded Rajiv Gandhi National Fellowship**