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## CONTENTS

<i>SUBJECT</i>	<i>PAGE NUMBER</i>
JURISDICTION	: 4326 – 4327
SPECIAL NOTICE	: 4328 – 4329
LIST OF HOLIDAYS FOR THE YEAR-2021 (ENGLISH)	: 4330
LIST OF HOLIDAYS FOR THE YEAR-2021 (HINDI)	: 4331
EARLY PUBLICATION (DELHI)	: 4332 – 4392
EARLY PUBLICATION (MUMBAI)	: 4393 – 4462
EARLY PUBLICATION (CHENNAI)	: 4463 – 4528
PUBLICATION AFTER 18 MONTHS (DELHI)	: 4529 – 4610
PUBLICATION AFTER 18 MONTHS (MUMBAI)	: 4611 – 4712
PUBLICATION AFTER 18 MONTHS (CHENNAI)	: 4713 – 4970
PUBLICATION AFTER 18 MONTHS (KOLKATA)	: 4971 – 4996
WEEKLY ISSUED FER (DELHI)	: 4997 – 5044
WEEKLY ISSUED FER (MUMBAI)	: 5045 – 5066
WEEKLY ISSUED FER (CHENNAI)	: 5067 – 5103
WEEKLY ISSUED FER (KOLKATA)	: 5104 – 5113
PUBLICATION UNDER SECTION 43(2) IN RESPECT OF THE GRANT (DELHI)	: 5114 – 5132
PUBLICATION UNDER SECTION 43(2) IN RESPECT OF THE GRANT (MUMBAI)	: 5133 – 5139
PUBLICATION UNDER SECTION 43(2) IN RESPECT OF THE GRANT (CHENNAI)	: 5140 – 5161
PUBLICATION UNDER SECTION 43(2) IN RESPECT OF THE GRANT (KOLKATA)	: 5162 – 5168
INTRODUCTION TO DESIGN PUBLICATION	: 5169
THE DESIGNS ACT, 2000 SECTION 30 DESIGN ASSIGNMENT	: 5170 – 5173
REGISTRATION OF DESIGNS	: 5174 - 5241

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(57) Abstract :

Wind energy is one of the renewable energy sources available in nature, which is generated using wind turbine system. This invention focuses on direct power control of wind turbine system operation at variable speed and constant frequency based on Internet of Things by proportional integral sliding mode control. This work results in optimal production of power by tracking the point of maximum power even when there is turbulent wind flow. The proposed controller involves two sub components namely a smart proportional integral module for compensating online disturbances and a module in sliding mode for the estimating errors due to circumventing disturbances. A direct power control of wind turbine system is proposed based on Internet of Things by proportional integral sliding mode control by the extended state observer which is integrated in the system for estimating the uncertain dynamics of the system. This system is tested on the platform of FAST/Simulink for a wind turbine system operating at 5 MW. The proposed system outperforms conventional proportional integral controller.

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