PSNA College of Engineering and Technology
Department of Electrical and Electronics Engineering
Serial Test-I
Special Electrical Machines

Year/Sem : IV/VII
Staff In-charge: M.Kaliamoorthy

Max.Marks:50
Time: 90 Mins
Sub Code: EE1001

Part A (9 * 2 = 18)

Answer any NINE questions

1. Mention the types of stepper motor.
2. State the advantages of VRSM
3. Differentiate between the single phase and two phase on mode operation
4. List the applications of stepper motor.
5. Define stepping rate.
6. Write the torque equation for stepper motor.
7. What is the need for logic sequencer?
8. Write the expression for step angle in terms of stator and rotor teeth
9. Define micro stepping.
10. Define the following terms: Slew range, Pull in/out torque and pull in/out rate.

Part B (2 *16 = 32)

Answer ALL questions

11. (a) Explain the construction and principle of operation of VRSM with neat diagram (8)

    (b) Derive the torque expression for stepper motor which uses the variable reluctance principle. (8)

Or

12. (a) Explain the operation of hybrid stepper motor. (8)

    (b) Why driver circuit is necessary for stepper motors. What are the problems associated with driver circuit. Explain with neat sketch about the special driver circuits (all the types) which over come the problems associated with it. (8)

13. (a) Draw the static and dynamic characteristics of stepper motor and explain each factors associated with that. (8)

    (b) Explain different and modes of excitation in stepper motor. (8)

Or

14. (a) Explain the operation of 2 pole 3 stack variable reluctance stepper motor. (8)

    (b) Derive the condition for stepping frequency under the condition when damping factor is considered. (8)

Staff In-Charge **Head of the Department**