H.T No: | | | | | | | | | | | **R18** **Course Code: B30322**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: SPECIAL ELECTRICAL MACHINES

(Power Electronics)

Date: 27.02.2023 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks. **5x4=20M**

1. Describe the principle of operation of PMBLDC motor. 4M
2. Briefly explain about synchronous reactance. Also write the expression for self and synchronous reactance of PMSM. 4M
3. List out the advantages of switched reluctance motors. 4M
4. Distinguish the half step and full step operations of a stepping motor. 4M
5. Elaborate the operating principle of Hysteresis motor. 4M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

6. A). Derive the expression for EMF and torque of a PMBLDC motor. Draw the relevant characteristics. 10M

OR

6. B). Discuss the use of Hall sensors for position sensing in PMBLDC motor with necessary block diagram. 10M

7. A). Explain the construction and working principle of operation of PMSM. 10M

OR

7. B). Derive the expression for power input and torque of a PMSM. Explain how its torque speed characteristics are obtained. 10M

8. A). Derive the torque equations of the variable reluctance motor and illustrate the various dependent parameters. 10M

OR

8. B). Discuss the various converter topologies for a 3 phase switched reluctance motor with merits and demerits of each. Explain any two of them. 10M

9. A). Discuss in detail, about the constriction and working principle of Variable reluctance stepper motors. 10M

(P.T.O..)

OR

9. B). i) Calculate the stepping angle for a 3 phase 24 pole permanent magnet type stepper motor. 4M

ii) Calculate the motor torque Tm required to accelerate an initial load of $0.2*10^{-3}$ kgm^2 from 500Hz to 1500Hz in 50ms.The frictional torque is 0.03Nm and step angle is 1.18^0. 6M

10. A). Explain the principle and operation of AC series motor and list the advantages of it. 10M

OR

10. B). Elaborate the construction and working principle of Linear motor. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: EMBEDDED SYSTEMS

(Power Electronics)

Date: 01.03.2023 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks. **5x4=20M**

1. Explain about different pipe lining techniques. 4M
2. Distinguish between different debugging methods. 4M
3. An audio system processes samples at a rate of 44.1 kHz. At what rate could we sample the system's front panel to both simplify analysis of the system schedule and provide adequate response to the user's front panel requests? 4M
4. Explain about assembly and linking in program design. 4M
5. Explain about design flows. 4M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

6. A). Assume that a system has a two-level cache: The level 1 cache has a hit rate of 90% and the level 2 cache has a hit rate of 97%. The level 1 cache access time is 4 ns, the level 2 access time is 15 ns, and the level 3 access time is 80 ns. What is the average memory access time? 10M

OR

6. B). Draw a UML sequence diagram that shows how an ARM processor handles a floating-point exception. The diagram should include the user program, the exception handler, and the exception handler table. 10M

7. A). Explain in detail about interrupts and prioritized interrupts. 10M

OR

7. B). Explain about program validation and testing in detail. 10M

8. A). Explain in detail about multiple tasks and multiple processes. 10M

OR

8. B). Discuss in detail about scheduling policies. 10M

9. A). Explain about CPU accelerators in an embedded system. 10M

OR

9. B). Explain the structure of I^2C bus. 10M

10. A). Explain in detail about quality assurance. 10M

OR

10. B). Explain about different design flows in embedded system. 10M

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