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**Course: B.Voc, Program: Production- Tool and Die Manufacturing**  
**Subject: Electrical Machines & Drives, Code: ME-606/LBME-204**  
**Semester- III/IV**

Time: 03 Hours

Max Marks: 35

**Instructions to the Students:**

1. This Question paper consists of two Sections. All sections are compulsory.
2. Section A comprises 10 questions of short answer type. All questions are compulsory. Each question carries 01 marks.
3. Section B comprises 8 long answer type questions out of which students must attempt any 5. Each question carries 05 marks.
4. Do not write anything on the question paper.

Q.No.

**SECTION –A(SHORT ANSWER TYPE QUESTIONS)**

Marks

- |    |   |   |     |
|----|---|---|-----|
| 1. | a | What is the phase relationship between the primary and secondary voltages of a transformer ?                    | (1) |
|    | b | Which material is used for the core of transformer and why?   | (1) |
|    | c | What are the factors which control the speed of a DC motor?   | (1) |
|    | d | What will be the result if the field circuit of a DC motor is opened ?  | (1) |
|    | e | Why does a DC series motor run at a dangerous speed without load ?  | (1) |
|    | f | Summarize the applications of a 3-phase squirrel cage induction motors ?  | (1) |
|    | g | What is the condition for maximum starting torque for an induction motor ?                                      | (1) |
|    | h | What will be the rotor frequency at the time of starting and at running condition in a 3-phase induction motor? | (1) |
|    | i | State the uses of permanent capacitor motors?   | (1) |
|    | j | What is universal motor ? Why is it called so ?   | (1) |

**SECTION –B (LONG ANSWER TYPE QUESTIONS)**

- |    |   |     |
|----|---|-----|
| 2. | Define voltage regulation of a transformer. For which type of load the voltage regulation is negative ? | (5) |
|----|---|-----|

3. The efficiency of a 20 KVA, 2500/250 volt, Single-phase transformer at unity power factor is 98 percentage at rated load and also at half rated load Determine (5)
- Determine
- (1) Transformer core loss
- (2) Full-load copper loss
4. Explain the necessity of starter in a DC motor and describe three- point starter with a neat sketch? (5)
5. Draw the speed-current, torque-current and speed-torque characteristics of DC series motor? (5)
6. Discuss briefly the various methods of speed control of 3-phase Induction motors ? (5)
7. What are the main features of stepper motor? Which are responsible for its wide spread use ? (5)
8. Briefly explain the principle of operation of (a) DC servomotors (5)
- (b) A.C servomotors. Draw their torque-speed characteristics?
9. Write short notes on following: (5)
1. Closed loop control of DC drives
  2. Four quadrant operation of Chopper

===END OF PAPER===