

I B. Tech II Semester Supplementary Examinations, March- 2022
ELECTRICAL AND MECHANICAL TECHNOLOGY
(Com. to ECE, EIE, ECC)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is Compulsory
3. Answer any **FOUR** Questions from **Part-B**

PART -A

1. a) Why the starter is required in the dc motor control? (3M)
- b) What is the principle of operation of alternator? (3M)
- c) What is meant by damping torque in the measuring instrument? (2M)
- d) Draw the pressure vs volume plot of a four stroke petrol engine cycle and indicate all the processes involved. (2M)
- e) What is a fin? Write its applications. (2M)
- f) Define soldering and brazing (2M)

PART -B

2. a) State the principle of operation of a d.c generator and derive the expression for the e.m.f. generated. (7M)
- b) Define voltage regulation and efficiency of a transformer? Explain how they vary with the load on the transformer? (7M)
3. a) Explain the concept of replacing armature reaction by a reactance in the alternator. (7M)
- b) Explain the principle of operation of three phase induction motor and describe their applications. (7M)
4. a) Explain the construction and working principle of moving coil type ammeter. (7M)
- b) Describe constructional details and working principle of dynamo meter type watt meter (7M)
5. a) With a neat sketch explain the working of wind energy system. Write its advantages and limitations. (7M)
- b) An engine of 250 mm bore and 375 mm stroke works on Otto cycle. The clearance volume is 0.00263 m^3 . The initial pressure and temperature are 1 bar and 50°C . If the maximum pressure is limited to 25 bar, find the following : (7M)
 - (i) The air standard efficiency of the cycle.
 - (ii) The mean effective pressure for the cycle.Assume the ideal conditions.
6. a) Discuss about different modes of heat transfer with relevant examples. (6M)
- b) Discuss about Blackbody radiation. (4M)
- c) Differentiate between natural convection and forced convection. (4M)
7. a) Differentiate between gas welding and arc welding process. With a neat sketch explain arc welding process. (7M)
- b) Explain the construction and working of a simple lathe. (7M)