

1	2	3	4	5	6	7	8	9	10	11	12
---	---	---	---	---	---	---	---	---	----	----	----

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Electrical and Electronics Engineering

(Regulations 2021)

Maximum : 100 marks

PART A — (10 × 2 = 20 marks)

- PART B — (5 × 13 = 65 marks)

- Or

- (b) Derive the expression for the field energy and co-energy of single excited magnetic system.

12. (a) An 8 pole lap connected armature has 960 conductors, a flux of 40 mWb per pole and a speed of 400 rpm. Calculate the emf generated. If the armature were wave connected generator at what speed must it be driven to generate 400 V.

Or

- (b) Draw and explain the load characteristics of DC shunt and compound generator and state the reason for their different characteristics.
13. (a) A 200 V DC shunt motor has an armature resistance of 0.25Ω and runs at 1100 rpm, Drawing an armature current of 40A. It is required to reduce the speed to 750 rpm. If the armature current remain same, find the additional resistance to be added in series with the armature circuit.

Or

- (b) What is Electrical braking and Explain the various types of braking in DC Motor with neat sketches.
14. (a) Explain the principle of operation of a transformer and also draw the vector diagram to represent a load in unity, leading and lagging power factor.

Or

- (b) A 1 kVA, 1000/200 V, 50Hz, 1Φ transformer has the following results
OC test : 1000 V, 0.24 A and 90W on HV side
SC test : 50 Hz, 5A and 110 W on HV side
Draw the equivalent circuit of the transformer referred to LV side.
15. (a) Derive an expression for saving in copper material in auto transformer over a two winding transformer of equal rating.

Or

- (b) Compare the features of various three phase transformer connections with the neat diagram.

PART C — ($1 \times 15 = 15$ marks)

16. (a) Describe with the neat sketch, the back to back test to obtain the efficiency on single phase transformers.

Or

- (b) In a long-shunt compound generator, the terminal voltage is 230 V when generator delivers 150 A. Determine
- (i) Induced emf (5)
 - (ii) Total power generated (5)
 - (iii) Distribution of this power. (5)
- Given that shunt field, series field and armature resistance are 92Ω , 0.015Ω and 0.032Ω respectively.