End Semester Examination, 2021

Semester - III

Physics

PAPER - SEC-I

Full Marks : 40

Time : 2 Hours

Gr - A

Answer any five questions : **5x2=10**

1.a) Define step up and step down transformers. 2

b) Write down a short note about 'Blue print'. 2

c) What is Ladder diagram ? 2

d) How will you improve the Emf in dynamo ? 2

e) A 4w carbon resister has the colour code of green, blue and yellow calculate maximum and minimum current that can be passed through it. 2

f) Define 'back-emf' of Dc-motor. 2

g) What is the value of capacitor with numerical Code 104 ? 2

h) Write down the essential components of motor. 2

Gr - B

Answer any four questions :- **4x5=20**

2. Derive the conversion formula from T-Network to π-Network. 5

3. Write down a short note about two phase and three phase generator. 5

4. Write down the working principle of de-motor. 5

5. Find the Thevenin's and Norton's equivalent circuit for the circuit of fig-1, between A and B. 5

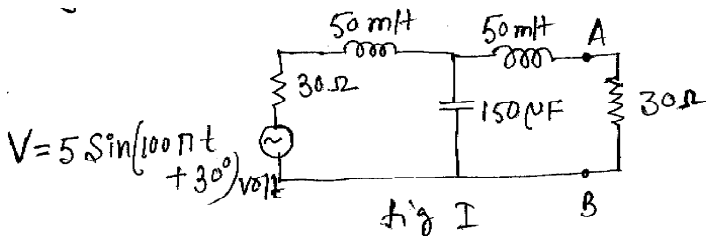

fig I

6.a) What are the differences between motor and dynamo ?

b) A battery with a constant emf '$\in$' and internal resistance r_1 provides power to an expernal circuit with a load resistances made up by combining resistance R_L and $2R_L$ in parallel. Find the value of R_L for which the power delivered to the load will be maximum. 3+2

7.a) How do you control speed and forque of a Dc motor ?

b) A resistance of 600 Ω is parallel to an inductance of reactance 600 (Ω) applied voltage, then find the total impedance of the circuit. 3+2

Gr - C

Answer any one questions :- **1x10=10**

8. Write down the working principle of Ac generator. Hence derive appropriate emf equation. Calculate rms value of this emf equation over full cycle. 10

9.a) What is a transformer ? In an ideal transformer, show that the ratio of output voltage to the input voltage is equal to the ratio of the number of secondary turns to the number of primary turns.

b) Enumerate different types of losses in a practical transformer ? How are these losses reduced ? 6+4