(b) The efficiency of 25 KVA, 1-ϕ transformer is 98.33% when delivering full load at 0.65 p.f. and 97.33% at half load at unity p.f. Calculate (i) Iron loss (ii) full load copper loss. 10

SECTION – D

8. A d.c. series motor runs at 1100 rpm on 150 V supply. The armature and field resistance is of 30 Ω and 0.6 Ω respectively. The total current taken by the motor from the supply is 14A. It is designed to reduce the speed to 800 r.p.m. keeping armature and field voltage same. What resistance should be inserted in the armature circuit ? 20

9. Explain construction and working principle of moving iron-type instruments. 20

Roll No. .....

24007

B. Tech 1st Semester (Common for All Branches) Examination – December, 2018

ELECTRICAL TECHNOLOGY

Paper : EE-101-F

Time : Three Hours] *[Maximum Marks : 100*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting ***one*** question from each Section. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. (a) Derive an expression for star-delta and delta to star conversion. 5

(b) Explain cut-off frequency and bandwidth in brief. 5

(c) Derive the expression for power equation in three phase. 5

(d) Differentiate the rotor construction of induction motor & synchronous motor. 5

SECTION – A

2. Calculate the maximum power through 4Ω resistance as shown in Fig. 1. below : 20

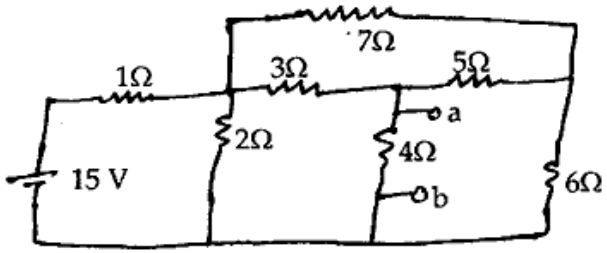


Fig. 1.

3. Apply superposition theorem in Fig. 2 below : 20

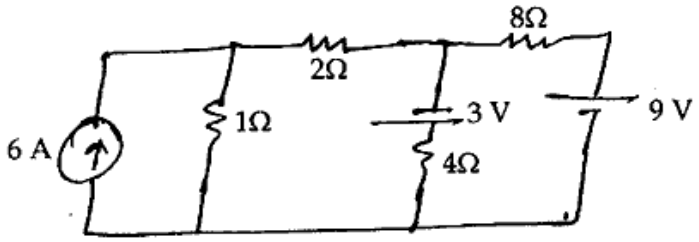
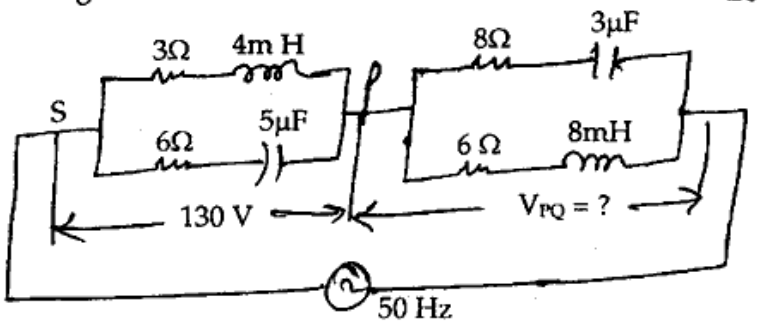


Fig. 2.

SECTION – B

4. Calculate the voltage across PQ section as shown in Fig. 3. 20



5. A voltage source of frequency 10 KHz is applied to an inductor in series with variable capacitor. When capacitor is set to 1.5 μf, I has maximum value, while it is reduced to 1/4th when capacitor is changed to 10 μf Find value of resistance of the coil and Q-factor. 20

SECTION – C

6. Write short notes on : 20

(a) Open circuit test of transformer.

(b) Short circuit test of transformer.

7. (a) A 1-ϕ transformer has turn ratio of 7 : 1 with primary resistance and reactance of 6 Ω and 0.3 Ω, while the secondary resistance & reactance are 10 Ω and 0.6 Ω respectively. Determine the percentage voltage regulation when delivering 110 A, 400 V at (i) 0.65 lagging of leading. 10