Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 23302   Roll No. [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]

B. Tech. Examination 2018-19

(Even Semester)

BASIC ELECTRICAL ENGINEERING

Time : Three Hours]   *[Maximum Marks : 60*

Note :– (i)   This question paper contains three sections.

(ii)   Section A is compulsory. Section B and C contains internal choices.

(iii)   Be precise your answer.

SECTION – A

1. Attempt all parts of the following : $8 \times 1 = 8$

   (a)   What is basis of Nodal Analysis?

   (b)   What do you mean by bilateral circuit elements?

   (c)   Define form factor.

P. T. O.

(d)   What is condition for series resonance?

(e)   Define MMF.

(f)   Which instrument can measure both AC and DC?

(g)   Write number of parallel path in wave winding.

(h)   Single phase induction motor can directly switched on.

SECTION – B

2.   Attempt any two parts of the following : $2 \times 6 = 12$

(a)   Determine the value of R_L in Figure-(a) for maximum power transfer and also find maximum power :
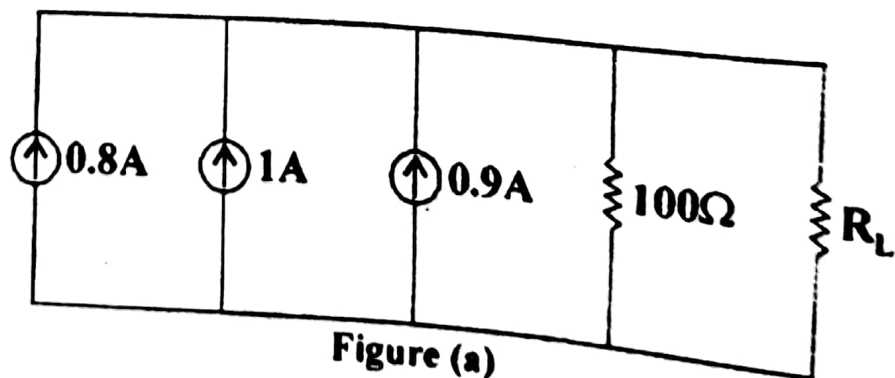

Figure (a)

(b)   Find the average value, rms value and form factor for full wave rectified alternating current.

(c)   Derive the e.m.f. equation of a single phase transformer.

(d) Derive an expression for torque of a d.c. motor. Also draw torque speed characteristics for d.c. shunt and series motors.

SECTION – C

Note :– Attempt all questions from this section. 10×4=40

3. Attempt any two parts of the following :

(a) Write the statement of maximum power theorem. Also derive for condition of maximum power. Also find efficiency of circuit on maximum power condition.

(b) Find out delta to star transformation and vice versa.

(c) Write the statement of Norton's theorem. Obtain Norton's equivalent circuit at terminal A and B for the network shown in figure-(b) :
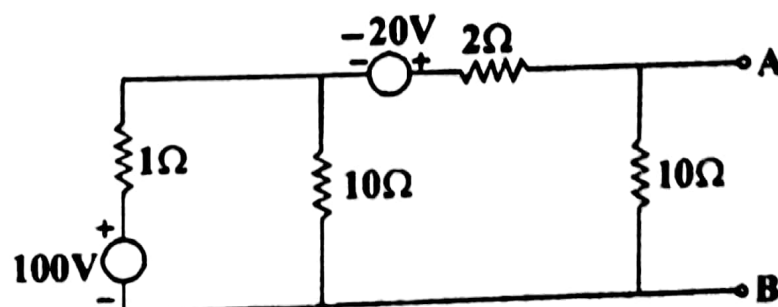

Figure (b)

/P. T. O.

4. Attempt any two parts of the following :

(a) Explain the concept of bandwidth and quality factor for series R-L-C circuit. Derive their expressions.

(b) Find relations between line and phase values for star-delta connection.

(c) Explain two wattmeter method of measuring three phase power with the help of phasor.

5. Attempt any two parts of the following :

(a) Describe the construction and working of a single phase induction type energy meter.

(b) Write similarities and dissimilarities between magnetic and electric circuit.

(c) A 25 KVA, 2200/200V, single-phase transformer has primary resistance of 1Ω and secondary resistance of 0.01Ω. Find the full load efficiency at 0.8 pf., if the iron loss in the transformer is 200W.

6. Attempt any two parts of the following :

(a) Derive e.m.f. equation of a d.c. generator. What will be the change in induced e.m.f. if the flux is reduced by 20% and the speed is increased by 20%?

(b) Explain the concept of rotating magnetic field also find magnitude and speed of rotating magnetic field. Also explain principle of operation of 3 phase induction motor.

(c) Why single phase induction motor is not self starting? Explain any one method of starting.

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