Roll No.:.....

National Institute of Technology, Delhi

B. Tech. Examination

Make up Examination May, 2019

Branch	**: Electrical & Electronics Engineering**	**Semester**	**: Fourth**
Title of the Course	**: Introduction to Electrical and Electronics Engineering**	**Course Code**	**: EEB 100**

Time: 3 Hours **Maximum Marks50**

Note : Symbols used in the questions are having their usual meaning. Assume if any data is missing.

Section- A- Attempt all questions. Write the short answer. **(1x10)**

Q.1 The open collector outputs of two inputs NAND gates are connected to a common pull up resistor is the input to the gates are P,Q and R, S respectively, The output is equal is

(a) $\overline{PQ}.\overline{RS}$ (b) $\overline{PQ}+\overline{RS}$ (c) PQ + RS (d) PQRS

Q.2 The superposition theorem is essentially based on the concept of

(a) duality (b) reciprocity (c) linearity (d) nonlinearity

Q. 3 single phase diode bridge circuit is supplied from a 100 V, 50Hz ac source to feed a dc load at an average current of 50A. The reduction in voltage due to a source inductance of 0.15 mH and internal drop at diode having the forward volt-drop relation of (0.5 + 0.02i) volts is:

a) 1% b) 2% c) 5% d) 3%

Q. 4 A NPN Si transistor is meant for low current audio amplification. Match its following characteristics against their values :

Characteristics	**Values**
(A) V_{EB} max	(P) 0.7 V
(B) V_{CB} max	(Q) 0.2 V
(C) V_{CE} max	(R) 6 V
	(S) 50 V

(a) A→P, B→R, C→S

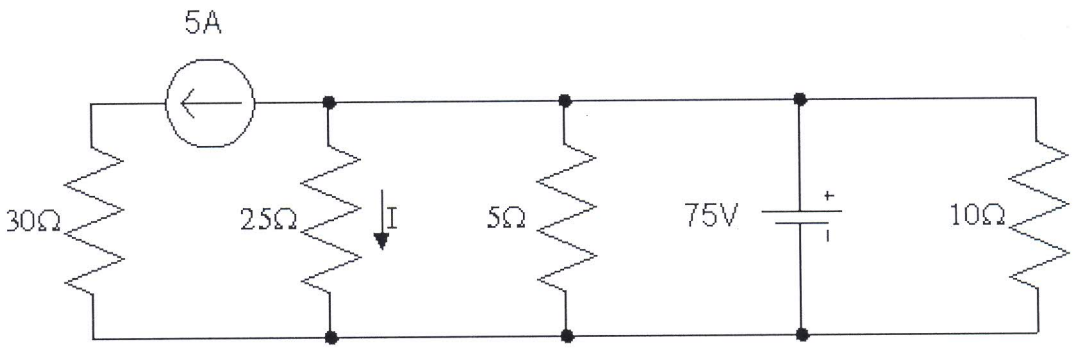
(b) A→R, B→P, C→S

(c) A→S, B→R, C→P

(d) A→P, B→R, C→Q

Q. 5 The Gray code for decimal number 6 is equivalent to--------

Q.6 In a below given electric circuit find the value of 'I'

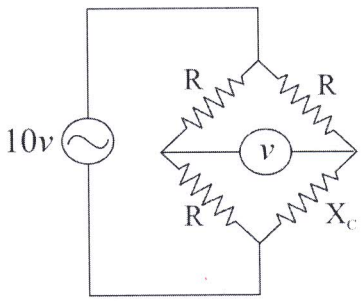


Q. 7 Why is Transformer Rated in KVA, not in KW ?

Q.8 The minimum number of resistor require to form a series –parallel combination is……..

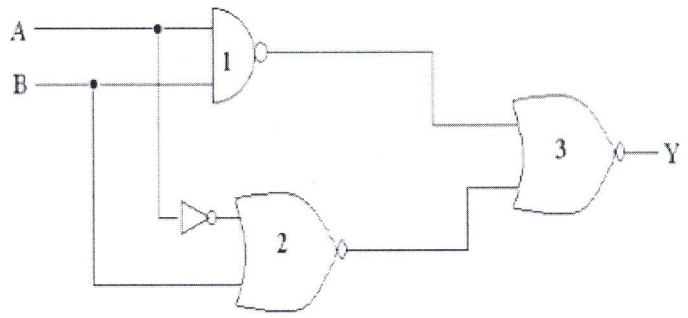
Q.9 When a capacitor in a circuit is fully charged, it behaves as a short circuit (True/False)

Q.10 In the bridge circuit shown in fig. when $\frac{X_c}{R} = 1$ the voltmeter reads;



Section- B- (Attempt any four questions) **(5x4)**

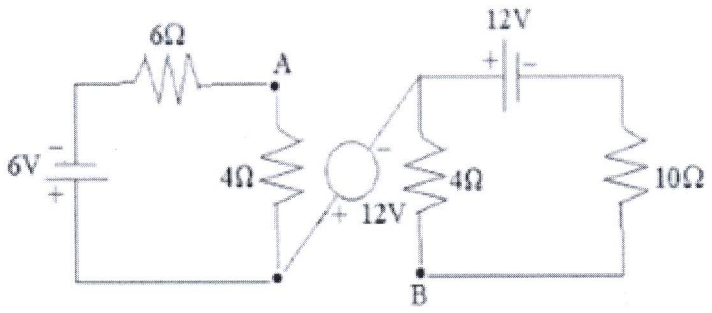
Q. 11 Find the Boolean expression for the logic circuit shown below:



Q. 12 With the help of neat diagram and expression derive the verification of maximum power transfer theorem.

Q. 13 A string of Deepawali lights consists of forty 3-W, 6-V bulbs connected in series. Calculate the current flows when the string is plugged into a 240-V socket, and what is the net hot resistance of each bulb.

Q.14 Obtain the voltage V_{AB} across terminals A and B in the network, shown in figure



Q.15 One meter long metallic wire is broken into two unequal parts P & Q. Part P of the wire is uniformly extended into another wire R. Length of R is twice the length of P and resistance of R is equal to that of Q. Find a) The ratio of the resistances of P and R, and b) The ratio of the length of P and Q.

Section- C- (Attempt any two questions) **(10x2)**

Q. 16 For a 1-Ø. 50-Hz. 150-kVA transformer, the required no-load voltage ratio is 5000-V/250-V. Find

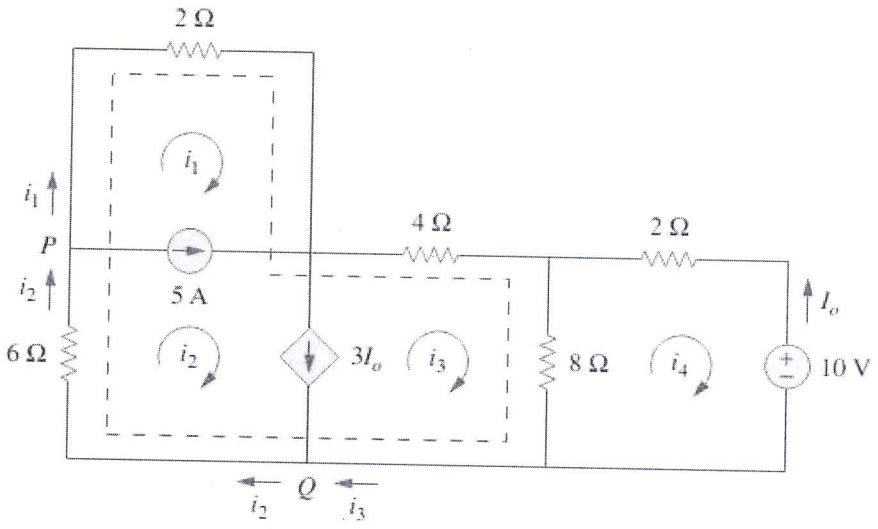
a) The number of turns in each winding for a maximum core flux of 0.06 Wb,

b) The efficiency at half rated kVA, and unity power factor

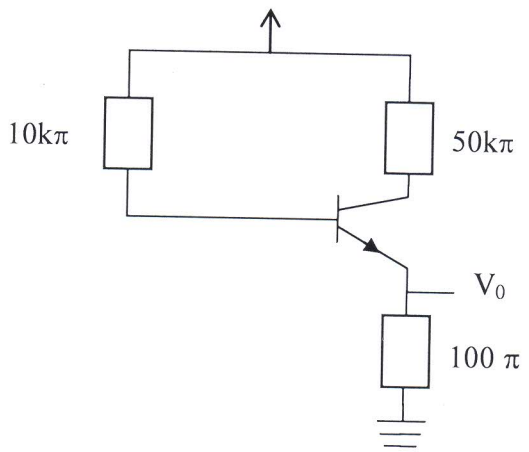
c) The efficiency at full load, and 0.8 power factor lagging, and

d) The kVA load for maximum efficiency, if the full-load copper losses are 1800W and core losses are 1500W.

Q. 17 Find i_1 and i_4 in the following circuit using mesh analysis:



Q.18 The transistor circuit shown uses a silicon transistor with V_{BE} = O.TV, IC ≈ I_E and a dc current gain of 100. The value of V_0 is:



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