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B—262—2019**FACULTY OF SCIENCE****B.Sc. (First Year) (First Semester) EXAMINATION****MARCH/APRIL, 2019****(CBCS/CGPA)****ELECTRONICS****(Electronics Components and Circuit Analysis—I)****(MCQ+Theory)****(Friday, 12-4-2019)****Time : 10.00 a.m. to 12.00 noon****Time—2 Hours****Maximum Marks—40****N.B. :- (i) All questions are compulsory.****(ii) All questions carry equal marks.****(MCQ)****1. Answer the following MCQs :****10****(i) In three band resistance colour code absence of fourth band indicates resistance tolerance of \pm ****(A) 10%****(B) 5%****(C) 15%****(D) 20%****(ii) The inductance of coil equal to $L =$ ****(A) $\frac{e}{dt}$** **(B) $\frac{l}{\mu_0 \mu_r AN^2}$** **(C) $\frac{\mu_0 \mu_r}{l AN^2}$** **(D) $\frac{AN^2}{\mu_0 \mu_r l}$** **(iii) The capacitance of capacitor is equal to $C =$ ****(A) $\frac{\Sigma_0 \Sigma_r}{A \cdot l}$** **(B) $\frac{\Sigma_0 \Sigma_r A}{d}$** **(C) $\frac{d}{\Sigma_0 \Sigma_r A}$** **(D) $\frac{\Sigma_0 A d}{\Sigma_r}$** **P.T.O.**

- (iv) According to commonly used sign convention for voltages
- (A) a fall in voltage is considered as positive
 - (B) a rise in voltage is considered as positive
 - (C) IR drop is taken as negative
 - (D) battery EMF's are taken as positive
- (v) According to Kirchhoff's current laws as applied to a junction in a network of conductor is
- (A) total currents meeting at the junction is zero
 - (B) no current leave junction without some current entering it
 - (C) net current flow at junction is positive
 - (D) algebraic sum of the current meeting at junction is zero
- (vi) The resistance of an ideal constant voltage source is equal to
- (A) infinite
 - (B) zero
 - (C) positive
 - (D) negative
- (vii) Norton's equivalent circuit consists of a
- (A) constant current source with a conductor in parallel
 - (B) constant current source in series with infinite resistance
 - (C) constant voltage source in parallel with a high resistance
 - (D) single voltage source and single current source
- (viii) The waveform of frequency 25 Hz, having time period of
- (A) 0.045 sec
 - (B) 0.5 sec
 - (C) 0.04 sec
 - (D) 0.4 sec

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- (ix) An alternating current is given by $i = 7.07 \sin\left(\omega t + \frac{\pi}{2}\right)$ has an rms value of A.
- (A) 10 (B) 14.14
(C) 1.96 (D) 7.07
- (x) A resonance curve for a series circuit is plot of frequency versus
- (A) voltage (B) impedance
(C) reactance (D) current

(Theory)

2. Attempt any *five* of the following : 10
- (a) What is iron core inductor?
(b) Define audio frequency transformer.
(c) Define capacitance of a capacitor.
(d) State Kirchhoff's voltage law.
(e) State Thevenin theorem.
(f) Define time period and frequency of alternating quantity.
(g) An RLC resonant circuit has a resonant frequency of 1 MHz and Q-factor of 100. Calculate the bandwidth of the circuit.
3. Attempt any *two* of the following : 10
- (a) Explain mutual inductance in an inductor.
(b) Give classification of transformer according to frequency range.
(c) Describe proportional voltage formula with suitable example.
(d) Explain instantaneous and rms value of alternating quantity.

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4. Attempt any *two* of the following :

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- (a) Explain controlling factors in capacitor.
- (b) State and explain maximum power transfer theorem.
- (c) Describe the resonance curve of series R-L-C circuit.
- (d) Describe vector representation of an alternating quantity and define harmonics.

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