

**B.Tech. MECHANICAL ENGINEERING
(COMPUTER INTEGRATED
MANUFACTURING) /
B.Tech. (AEROSPACE ENGINEERING) (BTAE)
Term-End Examination
December, 2018**

00713

**BME-021 : PRINCIPLES OF ELECTRICAL AND
ELECTRONICS SCIENCE**

Time : 3 hours

Maximum Marks : 70

Note : *Question no. 1 is compulsory. Answer any two from Section A and any two from Section B. Use of scientific calculator is allowed.*

1. State whether the following statements are *True* or *False* : *7×2=14*
- (a) The specific resistance of a conductor depends upon the nature of conductor material.
- (b) An ideal voltage source should have zero internal resistance.

- (c) Capacitance of a parallel plate capacitor decreases by increasing the area of plates.
- (d) The magnetic field strength 'H' and flux density 'B' are independent of each other.
- (e) 'BJT' can be used as an amplifier.
- (f) The efficiency of a transformer is independent of power factor.
- (g) A zener diode has a high amplification.

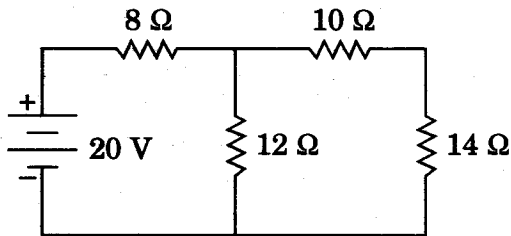
SECTION A

Answer any *two* questions from this section.

2. (a) A specimen of copper wire has a specific resistance of $1.72 \times 10^{-6} \Omega\text{-cm}$ at 0°C and has a temperature coefficient of $1/264.5$ at 30°C . Find the temperature coefficient and specific resistance at 80°C . 7

- (b) Define co-efficient of coupling and show that $K = M / \sqrt{L_1 L_2}$. 7

3. (a) Using Norton's theorem determine the current in 12Ω resistor in the following network. 7



- (b) Give the comparison between series and the parallel resonant circuits. 7

4. Write short notes on the following : $4 \times 3 \frac{1}{2} = 14$

- (a) Maximum power transfer theorem
- (b) Working principle of transformer
- (c) Speed control of 3- ϕ Induction motor
- (b) DC-Servomotor

SECTION B

Answer any **two** questions from this section.

5. (a) Draw the I-V characteristics of a zener diode illustrating the different regions of operations. 7
- (b) Explain how a BJT and MOSFET can be used as switch, with suitable diagrams. 7
6. (a) Explain with diagrams the working of a full wave bridge rectifier. 7
- (b) Draw the block diagram of IC Timer 555 and its various operating modes. 7
7. (a) What are the tri-state logic gates ? Explain the function of tri state inverter and buffer with the help of switches. 7
- (b) What are shift registers ? Explain the different types of shift registers. 7
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