



B.E/B.TECH DEGREE EXAMINATIONS: DEC 2014

(Regulation 2013)

Second Semester

U13EET211: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to AUTO/ME & BIO)

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

- Three capacitors of values $2\ \mu\text{F}$, $4\ \mu\text{F}$ and $4\ \mu\text{F}$ are connected in parallel, the capacitance of the combination is
 - $8\ \mu\text{F}$
 - $10\ \mu\text{F}$
 - $1\ \mu\text{F}$
 - $6\ \mu\text{F}$
- is the storage element which can store and deliver energy in electric field.
- The unit for flux density is
 - tesla
 - A/mm^2
 - N/m^2
 - Wb/m
-law states that, the magnitude of the induced EMF generated in a coil is directly proportional to the rate of change of magnetic flux
- The relationship between the frequency of ac wave and periodic time is given by
 - $f = T$
 - $f = 1/T$
 - $f = 1/T^2$
 - $f = T^2$
- The phase displacement between various phases of a three phase system is equal todegree.
- Three phase induction motors are widely used for industrial applications because
 - They are rugged in construction, requires less maintenance and are less expensive than other motors
 - Their speed can be controlled very smoothly over a wide range
 - Their operating characteristics are superior over other electrical motors
 - They can be manufactured easily for any HP rating
- If the speed of the prime mover of the dc generator is increased, the generated EMF will

9. Which type of rectifier requires four diodes:
- a) Half wave rectifier
 - b) Full wave bridge rectifier
 - c) Full wave rectifier
 - d) Diode is not used for rectifier
10. _____ gate and _____ gate are called as Universal gates.

PART B (10 x 2 = 20 Marks)

(Not more than 40 words)

- 11. State the limitations of ohm's law.
- 12. Define specific resistance
- 13. What is self inductance?
- 14. List the magnetic effect of electric current.
- 15. What is RMS value?
- 16. Define Power factor.
- 17. Mention the important components of DC motor
- 18. What is slip?
- 19. Draw the symbol of semiconductor diode.
- 20. What is the use of rectifier?

PART C (5 x 14 = 70 Marks)

(Not more than 400 words)

Q.No. 21 is Compulsory

21. (i) Find the resistance of a 120 m copper wire which has a circular cross-section (7) with a diameter of 0.25 cm. Assume that this conductor is at room temperature. Take resistivity of copper as $1.7 \times 10^{-8} \Omega\text{-m}$
- (ii) A certain soldering iron has a resistance of 600Ω when operated from a 230 (7) volts power line. How much current does it take from the power line?
22. a) Explain the following with relevant diagrams and units:
- i) Magnetic flux
 - ii) Magnetic flux density
 - iii) Magnetic field intensity
 - iv) Permeability

(OR)

- b) (i) Compare self inductance and mutual inductance (7)
- (ii) Write the expression for energy stored in magnetic field (7)

23. a) Define the following terms with respect to an alternating current

- i) Cycle
- ii) Time period
- iii) Frequency
- iv) Amplitude
- v) Peak to peak value
- vi) Phase
- vii) Phase difference

(OR)

b) Derive the expression for power in an AC circuit containing

- i) Pure resistance only
- ii) Pure Inductance only

24. a) (i) Explain the principle of operation of DC motor. (7)

(ii) With neat sketch, explain the construction and working principle of transformer (7)

(OR)

b) (i) Compare squirrel cage and wound rotor (7)

(ii) Describe the operation of any one single phase induction motor (7)

25. a) (i) Delineate the operation of full wave bridge rectifier along with the input and output voltage waveforms (10)

(ii) Give the various configurations of transistor and compare them. (4)

(OR)

b) Give the logic symbol, electrical equivalent and truth table for the following logic gates

- (i) AND
- (ii) OR
- (iii) NOR
- (iv) NAND
