**A** **Reg. No. :** | | | | | | | | | | |

# Question Paper Code: 52308

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2019

Second Semester

Civil Engineering

15UEE208 - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to Mechanical Engineering, Chemical and Agriculture Engineering)

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Three resistances of 10 Ω, 15 Ω and 30 Ω are connected in parallel the total resistance of the combination is CO1- App

   (a) 5 Ω (b) 10 Ω (c) 15 Ω (d) 55 Ω

2. All the rules and laws of DC circuit also apply to AC circuit containing CO1- R

   (a) Capacitance only (b) Inductance only (c) Resistance only (d) all above

3. The field coils of DC generator are usually made of CO2- R

   (a) Mica (b) Copper (c) Cast iron (d) Carbon

4. What will happen if the back Emf of a DC motor vanishes suddenly? CO2-U

   (a) The motor will stop (b) The motor will continues to run

   (c) The armature may burn (d) The motor will run noisy

5. In “p” type material, minority carriers would be: CO3- R

   (a) Holes (b) Dopants (c) Slower (d) Electrons

6. A current ratio of $I_C/I_E$ is usually less than one and is called: CO3- R

   (a) Omega (b) Alpha (c) Theta (d) Beta

7. Convert $10101101_2$ to decimal number CO4- R

(a) 172 (b) 173 (c) 174 (d) 175

8. Among the following which one is universal gate CO4- R

(a) NOT (b) NAND (c) AND (d) OR

9. In case of amplitude modulation if modulation index > 1 then CO5- R

(a) There will be interference with another signal

(b) The bandwidth will decrease

(c) The wave will get distorted

(d) The efficiency of transmission will improve.

10. India's first three-axis stabilized geostationary communication satellite is CO5- R

(a) Rohini (b) Aryabhatta (c)Apple (d) Bhaskara

PART – B (5 x 2= 10 Marks)

11. Define power and power factor in AC circuits CO1- R

12. Mention the various types of single phase induction motor CO2- R

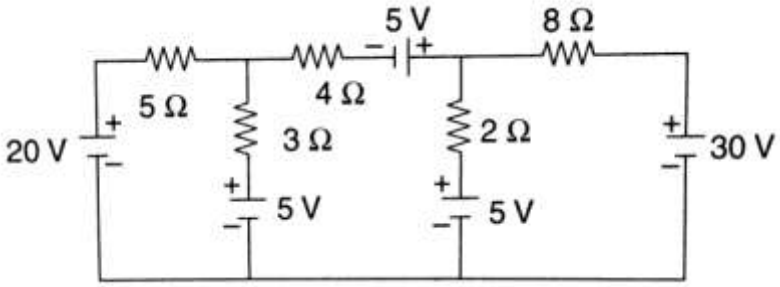
13. List the biasing techniques for transistor. CO3- R

14. Prove that $A + \bar{A}\,B = A+B$ CO4-App

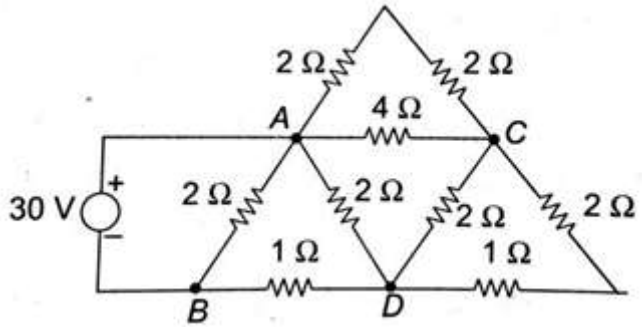
15. Compare analog and digital signals CO5-Ana

PART – C (5 x 16= 80 Marks)

16. (a) (i) Determine the current flow through 2 Ω resistor and voltage across 8 Ω resistors in given circuit. CO1- App (8)



(a) (ii) Determine the total equivalent resistance for the circuit CO1- App (8)




Or

(b) Derive an expression for RMS value and average value of a sinusoidal waveform. CO1- App (16)

17. (a) Describe with neat sketch construction and working of single phase transformer. CO2- U (16)

Or

(b) With neat sketch explain construction and working of moving coil instruments. CO2- U (16)

18. (a) Draw and explain common base configuration of BJT and its charactertics. CO3- Ana (16)

Or

(b) Describe the principle of working of forward based PN junction diode and it's charactertics. CO3- Ana (16)

19. (a) (i) Convert the Boolean expression $A\bar{B}C + \bar{B}CD + A\bar{C}D$ to standard SOP form. CO4- U (8)

(ii) State and prove Demorgan's theorem. CO4- U (8)

Or

(b) (i) Simplify the Boolean expression using laws and rules of Boolean algebra $Z = [A\bar{B}(C + BD) + (\overline{AB})C$ CO4- U (8)

(ii) Implement the expression using logic gates CO4- U (8)

(a) AB+BCD+EFGH

(b) (A+B)(F+G+H+I)

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|---|---|---|---|---|
| 20. | (a) | With neat diagram explain amplitude modulation and frequency modulation. | CO5- U | (16) |
| | | Or | | |
| | (b) | With neat block diagram explain the operation of the following | CO5- U | (16) |
| | | (i) Satellite communication systems | | |
| | | (ii) Optical fibre communication systems | | |