Reg. No. : | | | | | | | | | | |

Question Paper Code: 51231

B.E. / B.Tech. DEGREE EXAMINATION, JUNE 2016

Second Semester

Civil Engineering

15UEE208 - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to Mechanical Engineering and Chemical Engineering)

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The form factor is the ratio of

   (a) Peak value to r.m.s. value (b) r.m.s. value to average value
   (c) Average value to r.m.s. value (d) None of these

2. The power factor of a purely resistive circuit is

   (a) Zero (b) Unity (c) Lagging (d) Leading

3. The efficiency of a transformer is maximum when

   (a) It runs at half full load (b) It runs at full load
   (c) Its Cu loss equals iron loss (d) It runs overload

4. Moving Iron instruments can be used on

   (a) Both AC and DC (b) AC only
   (c) DC only (d) None of these

5. Which of the following diodes is operated in reverse bias mode?

   (a) P-N junction (b) Zener (c) Tunnel (d) Schottky

6. An intrinsic semiconductor at the absolute zero temperature

(a) behaves like a metallic conductor (b) behaves like an insulator
(c) has a large number of holes (d) has a large number of electrons

7. The output of a NOR gate is HIGH if,

(a) all inputs are HIGH (b) any input is HIGH
(c) any input is LOW (d) all inputs are LOW

8. Give the decimal value of binary 10010

(a) 6_{10} (b) 9_{10} (c) 18_{10} (d) 20_{10}

9. Modulation is used to:

(a) Reduce the bandwidth
(b) Separate differing transmission
(c) Ensure that information may be transmitted over long distances
(d) Allow the use of practicable antenna

10. A transponder is a satellite equipment which

(a) receives a signal from earth station and amplifies
(b) changes the frequency of the received signal
(c) retransmits the received signal
(d) all the above

PART - B (5 x 2 = 10 Marks)

11. Three 10 $k\Omega$ resistors are connected in series. A 20 $k\Omega$ resistor is connected in parallel across one of the 10 $k\Omega$ resistors. The voltage source is 24 V. What is the total current in the circuit?

12. What is the difference in construction between core and shell type transformer?

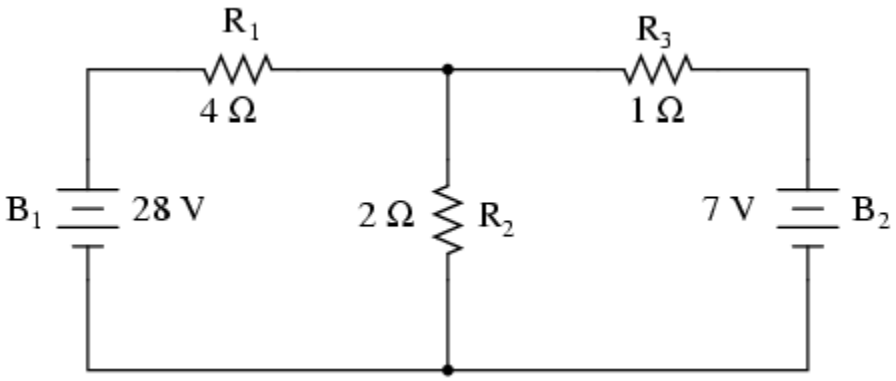
13. What is Zener breakdown?

14. State DeMorgan's theorem.

15. Define amplitude modulation.

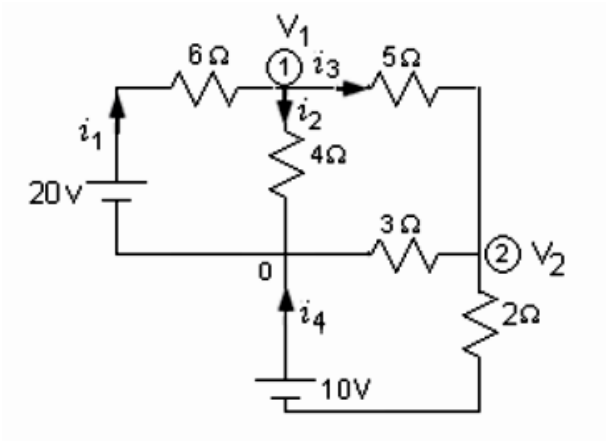
PART - C (5 x 16 = 80 Marks)

16. (a) Construct the mesh equations for the following circuit and find I_1 and I_2. (16)



Or

(b) Find the node voltages V_1 and V_2 for the following circuit. (16)



17. (a) Describe the construction and working of DC generator. (16)

Or

(b) Explain briefly about PMMC instrument with torque equation. Mention its advantages and disadvantages. (16)

18. (a) Explain the theory and characteristics of PN junction diode. (16)

Or

(b) Explain the characteristics of BJT in CE configurations with input and output characteristics. (16)

19. (a) (i) State and prove DeMorgan's theorem. (8)

(ii) Show how that the NAND and NOR gate are universal building blocks. (8)

Or

(b) (i) Reduce the following Boolean expressions

(1) $(x'y' + z)' + z + xy + wz$

(2) $A'B(D' + C'D) + B(A + A'CD)$ (8)

(ii) Discuss the operation of full adder with circuit diagram and truth table. (8)

20. (a) Explain the working principles of amplitude modulation and frequency modulation with neat diagram. Mention its advantages and disadvantages. (16)

Or

(b) (i) Draw and explain the block diagram of satellite communication systems. (8)

(ii) Draw the block diagram of an optical fibre communication system and explain it in detail. (8)

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