

16020(D) - 0 DEC 2016

B. Tech 1st Semester Examination

Basic Electrical & Electronics Engineering (NS)

BE-101

Time : 3 Hours

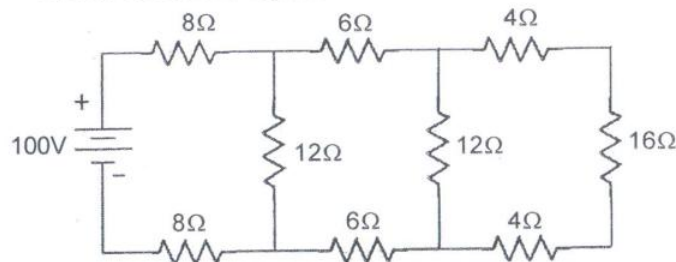
Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting one question each from section A, B, C & D. Section-E is compulsory.

SECTION - A

1. (a) Calculate (a) the equivalent resistances across the terminals of the supply, (b) total current supplied by the source and (c) power delivered to 16 ohm resistor in the circuit shown in figure. (12)



- (b) Explain the construction and principle of operation of single phase energy meter. (8)
2. (a) A series circuit of  $R = 10\Omega$  and  $X = 15\Omega$  has an applied phasor voltage  $V = 50 \angle -90^\circ$  rms. Find the real power, reactive power, complete power and power factor. (10)
- (b) Define r.m.s, average, form factor and peak factor of a sinusoidal alternating voltage. Compute the form factor of full wave rectifier. (10)

SECTION - B

3. (a) Discuss the phasor relationship between emf and current when a.c flows through series R-C circuit. (8)
- (b) A resistance of  $10\Omega$ , inductance of  $0.5H$  and a capacitance of  $150\mu F$  are connected in series across ac  $200V$ ,  $100Hz$  supply. Calculate the current and its power factor, power consumed and phase angle mentioning whether its leading or lagging. (12)
4. (a) Three impedances  $Z_1 = (10+j0)\Omega$ , connected between lines A & B,  $Z_2 = (8+j6)\Omega$  connected between lines B&C,  $Z_3 = (5-j5)\Omega$  connected between lines C & A, are delta connected to a symmetrical 3-phase  $400V$   $50Hz$  supply of phase sequence ABC. Calculate the phase & line currents & the total active power consumed. (12)
- (b) Explain the principle of operation of DC Motor. (8)

SECTION - C

5. (a) Explain the various types of semiconductors with neat diagram. (10)
- (b) Explain the construction and operation of full wave rectifier. (10)
6. (a) Explain the input and output characteristics of transistors in common emitter configuration. (10)
- (b) Explain the construction and characteristics of BJT's. (10)

SECTION - D

7. (a) What are JFETs? Draw and explain its characteristics. (10)
- (b) Explain the working principle of CRO. (10)

[P.T.O.]

8. (a) Explain the construction and characteristics of amplifiers. (12)
- (b) What are IC's? How they work? (8)

**SECTION - E**

9. (a) How resistance is affected by temperature?
- (b) Write the relation between the line and phase quantities for balance star and delta connected load.
- (c) Mention two types of MI instruments.
- (d) Define voltage regulation of a transformer.
- (e) What is P-type and N-type semiconductor?
- (f) How are amplifiers classified according to the input?
- (g) What is CRO?
- (h) What is forward bias and reverse bias in a PN junction?
- (i) What is avalanche break down in diodes?
- (j) What are the applications of step-up and step-down transformers? (2×10=20)