

D 2322

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Name.....

Reg. No.....

**THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE
EXAMINATION, DECEMBER 2009**

CE 04 306—ELECTRICAL AND ELECTRONICS ENGINEERING

(2004 admissions)

Time : Three Hours

Maximum : 100 Marks

Part A

- I. (a) The effective resistance of two resistors connected in parallel is 8Ω . The resistance of one of the resistors is 12Ω . Calculate : (i) The resistance of the other resistor, (ii) The effective resistance of the two resistors connected in series.
- (b) A Voltage, $100 \sin 314t$ Volts, is maintained across a circuit consisting of a half - wave rectifier in series with a 50Ω resistor. The resistance of the rectifier may be assumed to be negligible in the forward direction and infinity in the reverse direction. Calculate the average and the r.m.s. values of the current.
- (c) Discuss the different types of wiring bringing out the merits and demerits of each.
- (d) Draw the wiring diagram of fluorescent lamp.
- (e) In a four bit D/A converter, the highest weighted resistor has a value of $299\text{ k-}\Omega$. Determine the resistance of the other resistors.
- (f) Explain the relationship between h_{oe} and a suitable device characteristic.
- (g) Describe the different criteria for selection of transducers for a particular application.
- (h) Describe an overview of applications of a CRO.

(8 × 5 = 40 marks)

Part B

- II. (a) (i) Describe the working of a Star – delta starter. (5 marks)
- (ii) List the applications of single phase induction motor. (5 marks)
- (iii) What is the need for starter in a dc motor ? (5 marks)

Or

Turn over

- (b) (i) A series circuit having a resistance of 10Ω , an inductance of 0.025H and a variable capacitance is connected to 100V , 25Hz Supply. Calculate : (1) the capacitance when the value of capacitance, also calculate ; (2) the circuit impedance ; (3) The circuit power factor ; and (iii) The power consumed.

(7 marks)

- (ii) A coil of resistance 10 ohms and an inductance of 1 H and a capacitance of $15.83 \mu\text{F}$ are connected in series across 100 V Supply. The current drawn is found to be 10 A . Determine the frequency of Supply.

(8 marks)

III. (a) Write the ratings for following appliances : —

- | | |
|--------------------------------|---------------------------------|
| (i) Mixer. | (ii) Frying pan. |
| (iii) Heater Portable. | (iv) Washing Machine automatic. |
| (v) Projector, Slide or movie. | |

(15 marks)

Or

- (b) Explain about types of wiring. List any *two* wiring methods with its advantages and disadvantages.

(15 marks)

IV. (a) (i) Compare half - wave, full - wave and bridge rectifiers.

(5 marks)

(ii) What is the need for filters in power supplies ?

(5 marks)

(iii) Explain the various types of filters used in power supplies.

(5 marks)

Or

- (b) (i) A D/A R – $2R$ ladder circuit. The value of R is $1 \text{ k}\Omega$ and the input is 0010 . Determine the output voltage.

(5 marks)

(ii) In a four - bit D/A converter, the lowest weighted resistor has a value of $15 \text{ k}\Omega$. Determine the resistances of the other resistors.

(5 marks)

(iii) A 5 bit D/A converter has a voltage output for a binary input of 10100 , an output Voltage of 12 mV is produced. Determine the output voltage when the binary input is 11100 .

(5 marks)

- V. (a) Describe the different types of weirs and flumes are used for measurement of flow in open channels. Derive the related expressions.

(15 marks)

Or

- (b) (i) Describe the construction of foil type strain gauges and explain their advantages over wire-wound strain gauges.

(7 marks)

- (ii) Explain the construction of Semi-conductor strain gauges and explain their advantages and disadvantages.

(8 marks)

[4 × 15 = 60 marks]