DI-104

December-2013

B.Sc. Sem.-I

CC–3 : Electronics : Paper-101

Time : 3 Hours]   **[Max. Marks : 70**

1.   (a)   Explain classification of Resistors in detail with necessary diagrams.   **7**

<div align="center">OR</div>

      (a)   What is shunt resistor ?
A 1 mA. meter movement with an internal resistance of 100 Ω is to be converted into a (0-100 mA) ammeter. Calculate the value of shunt resistance required.

      (b)   What is capacitor ? Describe the different types of capacitors in detail.   **7**

<div align="center">OR</div>

      (b)   What is a switch ? Describe the different types of switches. What kind of switch is used in television ?

2.   (a)   What is clipping circuit ? What is difference between positive and negative clippers ? Explain with the help of an output waveform.   **7**

<div align="center">OR</div>

      (a)   In what respect is an LED different from an ordinary PN Junction diode ? State applications of LEDs.

      (b)   Draw the circuit diagram of positive series clipper and positive shunt clipper circuits, showing the input and output waveforms. Also, explain their operation in detail.   **7**

<div align="center">OR</div>

      (b)   What is Varactor diode ? Explain briefly, how it can be used in tuning circuit.

3.   (a)   Draw the block diagram of an amplifier and discuss the concept of amplification. Write the basic notations of an amplifier. Also, derive the equation for current gain and voltage gain.   **7**

<div align="center">OR</div>

      (a)   Draw the block diagram of an output power meter and explain the function of each and every block in detail.

      (b)   What is harmonic distortion ? Explain three point method to calculate harmonic distortion with necessary equations.   **7**

<div align="center">OR</div>

      (b)   What power ratio is one bel ? What is decibel ? Why it is required ? Explain it in detail with appropriate equations.

Under what conditions is the power gain in decibels equal to $20 \log \left(\dfrac{Vo}{Vi} \right)$?

4. Do as directed : (any **five**) **14**

   (a) Convert the following binary Nos. into a hexadecimal Nos.

       (i)   1000 1100   (ii)   1111 0101   (iii) 0011 0111

   (b) What are the hexadecimal Nos. that follow each of these ?

       (i)   ABCD   (ii)   8F4F   (iii) BEEF

   (c) Convert the following octal Nos. into its decimal equivalents.

       (i)   257   (ii)   103   (iii) 44

   (d) Convert the following hexadecimal Nos. into its binary equivalent.

       (i)   E5   (ii)   B4D   (iii) 7AF4

   (e) Find 2's compliment of the following Nos.

       (i)   00001111   (ii)   1011 1110   (iii) 0101 1010

   (f) Show the binary addition of following Nos.

       (i)   1011 1110 + 1010 0111

       (ii) 1001 1110 + 1000 1100

5. Answer in short : **14**

   (1) What is resistor ?

   (2) What is circuit breaker ?

   (3) What is PCB ?

   (4) What are different types of inductors ?

   (5) What is clamper circuit ?

   (6) Name any four different types special purpose diodes.

   (7) What is photoconductive cell ?

   (8) What is the input and output resistance of an ideal amplifier ?

   (9) Name different types of distortion in an amplifier.

   (10) How many main classes of an amplifier operations are there ?

   (11) What is 1's compliment of No. 0011 1100 ?

   (12) What is next hexadecimal No. of ACEF ?

   (13) Determine the resistance and tolerance ratings for the following colour codes :

       (i)   Yellow, violet, black and gold.

   (14) What do you mean by the Q factor of an inductor L ?

   _____