

F.Y. B. SC. (COMPUTER SCIENCE) SEM – I (CBCS - 2016

COURSE) : WINTER - 2017

SUBJECT : PRINCIPLES OF ANALOG ELECTRONICS – I

Day : Friday
Date : 03/11/2017

W-2017-0704

Time : 11.00 A.M. TO 02.00 PM
Max. Marks : 60

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw diagrams **WHEREVER** necessary.
- 4) Use of scientific **CALCULATOR** is allowed.

Q.1 A) Select the correct option and rewrite the complete sentence: [06]

- a) UJT stands for _____.
 - i) Unijunction Thermistor
 - ii) Unijunction Transistor
 - iii) Unjunction Transistor
 - iv) Unjunction Thermistor
- b) V_{Th} is known as _____.
 - i) Thompson's voltage
 - ii) Thomsan's voltage
 - iii) Thevenin's voltage
 - iv) Threshold voltage
- c) In case of a transistor α_{dc} is the ratio of _____.
 - i) $\frac{\Delta I_E}{\Delta I_C}$
 - ii) $\frac{\Delta I_C}{\Delta I_E}$
 - iii) $\frac{\Delta I_C}{\Delta I_B}$
 - iv) $\frac{\Delta I_B}{\Delta I_C}$
- d) For a n-channel FET the voltage V_{GS} at which I_D becomes zero is called _____ voltage.
 - i) Punching off
 - ii) Pushing off
 - iii) Pinched off
 - iv) Preserve off
- e) Turns ratio for a transformer is defined as _____.
 - i) $\frac{N_p}{N_s}$
 - ii) $\frac{N_s}{N_p}$
 - iii) $\frac{P_s}{P_p}$
 - iv) $\frac{\Delta I_B}{\Delta I_C}$
- f) In _____ region of transistor characteristics the current flow is minimum.
 - i) Cut-off
 - ii) Forbidden
 - iii) Saturation
 - iv) Active

B) Answer all the questions in one sentence: [06]

- a) Draw symbol for SCR.
- b) What does Q-point indicate?
- c) Explain need of amplifier circuit.
- d) Calculate I_E in a transistor for which $\beta = 50$ and $I_B = 20 \mu A$.
- e) Define inductance.
- f) Find the value of resistance if colour bands are brown, black, orange and gold.

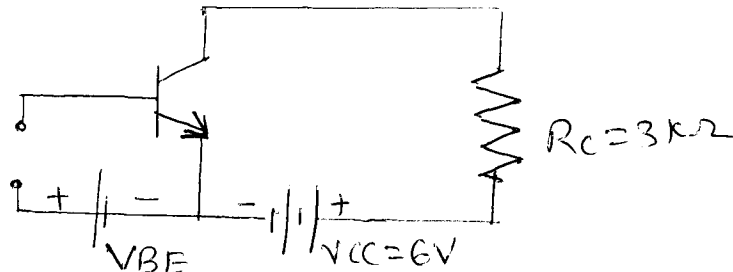
Q.2 Answer ANY THREE of the following: [12]

- a) Give the statements for the following:
 - i) Maximum Power transfer theorem
 - ii) Superposition theorem
- b) Explain the working of SCR.
- c) With necessary diagram explain potential divider biasing method for transistors.
- d) Give the classification of amplifiers on the basis of Q-point. Explain any two.

P.T.O.

Q.3 Answer **ANY FOUR** of the following: [12]

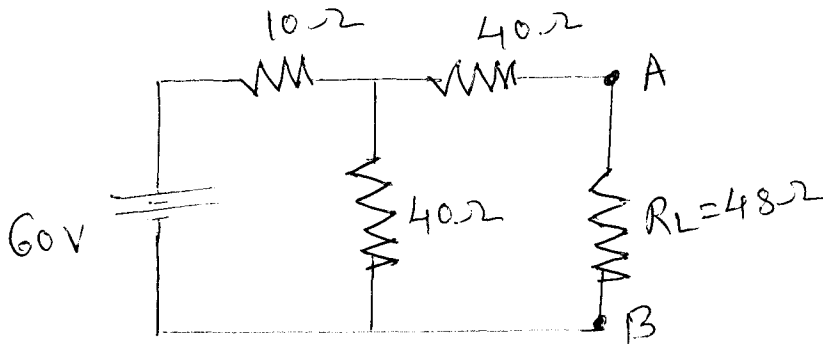
- Explain the construction of n-channel JFET with necessary diagram.
- Give three points of difference between BJT and FET.
- In the following circuit diagram if $V_{CC} = 6V$ and $R_C = 3 k\Omega$, draw the dc load line. What will be the Q-point if zero signal base current is $20\mu A$ and $\beta = 50$



- Explain colour code theory to find value of fixed resistors.
- Draw well labeled circuit diagram for RC – coupled amplifier.

Q.4 Answer **ANY TWO** of the following: [12]

- Find the current through the load using Norton's Theorem.



- With necessary diagram explain the working principle of n-channel depletion MOSFET.
- Explain the output characteristics curve for transistor in CE – mode.

Q.5 Answer **ANY TWO** of the following: [12]

- The following readings were obtained experimentally from a JFET:

V_{GS}	0V	0V	-0.2V
V_{DS}	7V	15V	15V
I_D	10mA	10.25 mA	9.65 mA

Determine : i) Drain resistance ii) Transconductance iii) Amplification factor

- Explain working of transistor as switch with necessary diagram.
- Explain the working of UJT as relaxation oscillator.

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