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BIEL-027

DECVI / DELVI / DCSVI / ACECVI / ACELVI / ACSVI

Term-End Examination

00416

June, 2016

BIEL-027 : APPLIED ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *Question number **1** is **compulsory**. Attempt any **four** questions from the rest. Each question carries equal marks.*

1. This question contains objective type questions. *7×2=14*

(a) A UJT relaxation oscillator circuit produces a sawtooth like waveform

(i) at B_1 terminal

(ii) at B_2 terminal

(iii) across the capacitor

(iv) None of these

(b) Depletion MOSFETs can operate in

(i) depletion mode only

(ii) enhancement mode only

(iii) both depletion and enhancement modes

(iv) None of these

(c) A Schmitt trigger circuit is a type of

(i) bistable multivibrator circuit

(ii) monostable multivibrator circuit

(iii) astable multivibrator circuit

(iv) None of these

(d) According to Barkhausen criteria for sustained oscillations,

(i) $\beta A < 1$

(ii) $\beta A > 1$

(iii) $\beta A = 1$

(iv) $\beta A = 0$

(e) Voltage – Shunt feedback stabilizes

(i) voltage gain

(ii) current gain

(iii) transresistance

(iv) transconductance

(f) Which of the following best describes a Class-A amplifier ?

(i) High efficiency and high distortion

(ii) Low efficiency and high distortion

(iii) Low efficiency and low distortion

(iv) High efficiency and low distortion

(g) Class-C amplifiers are generally used as

(i) Power amplifiers

(ii) RF amplifiers

(iii) Audio amplifiers

(iv) None of these

2. (a) How does the circuit configuration of an oscillator differ from that of an amplifier ? What are the different constituents of an oscillator circuit ? 7

(b) With the help of a relevant circuit diagram, briefly describe the operation of an RC phase shift oscillator. What is the phase shift introduced by each of the three RC sections in the feedback network at the operating frequency ? 7

3. (a) Differentiate between the construction of enhancement type MOSFET and depletion type MOSFET. Explain the V – I characteristics of a depletion type MOSFET. 7

(b) For the self-bias circuit shown below, determine the value of drain current I_D and gate-source voltage (V_{GS}). 7

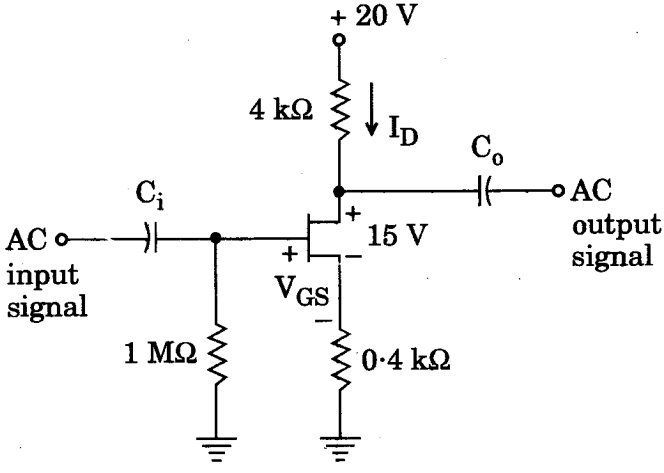

Figure 3(b)

4. (a) Sketch the output voltage V_{out} for the circuit shown in Figure 4(a). Assume diodes D_1 and D_2 to be ideal diodes. 7

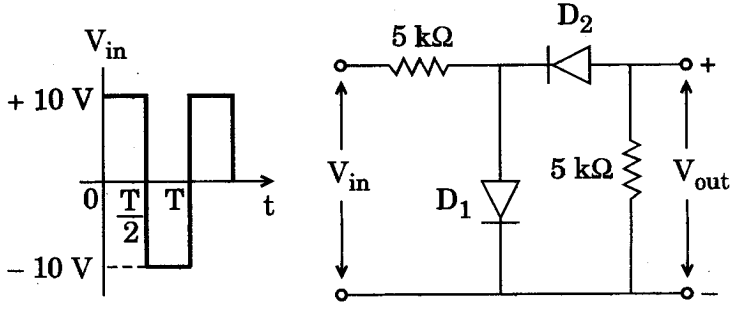

Figure 4(a)

(b) Draw and explain the working of a Bistable multivibrator. Give its specific application. 7

5. (a) What is crossover distortion ? What are the main factors that lead to crossover distortion and how can they be removed ? 7

(b) Draw the circuit diagram of Class-A push-pull amplifier and explain its principle of operation. 7

6. (a) What type of negative feedback should be used in an amplifier to make it work like a true (i) current to voltage converter, and (ii) voltage to current converter ? Justify your answer. 7

(b) What are tuned amplifiers ? What is the fundamental difference between audio-amplifiers and tuned amplifiers ? 7

7. (a) Enumerate the various methods which are employed for generating time-base waves. Give a circuit diagram for an exponential sweep circuit and explain its operation. 7

(b) Determine the output voltage V_0 for the circuit shown in Figure 7(b) for the input signal shown in the same Figure 7(b). 7

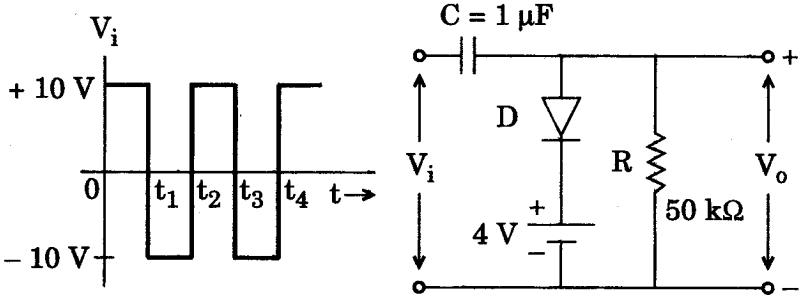

Figure 7(b)

8. Write short notes on any ***four*** of the following : $4 \times 3\frac{1}{2} = 14$

(a) Applications of Time-base Geneator

(b) Schmitt Trigger

(c) UJT Relaxation Oscillator

(d) Colpitts Oscillator

(e) Double Tuned Amplifiers

(f) Advantages of Transformer Coupled Power Amplifiers