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BIEL-027

DECVI / DELVI / DCSVI / ACECVI / ACELVI / ACSVI

00503

Term-End Examination

December, 2016

BIEL-027 : APPLIED ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *Question number **1** is **compulsory**. Attempt any **four** questions from the rest.*

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

(a) Push-pull is almost always used with

(i) Class A

(ii) Class B

(iii) Class C

(iv) All of the above

(b) The power rating of a transistor can be increased by

(i) Raising the temperature

(ii) Using a heat sink

(iii) Using derating curve

(iv) Operating with no input signal

(c) The easiest way to bias a JFET in the ohmic region is with

(i) Voltage divider bias

(ii) Self bias

(iii) Gate bias

(iv) Source bias

(d) The kind of oscillator found in an electronic wrist-watch is the

(i) Armstrong

(ii) Clapp

(iii) Colpitts

(iv) Quartz crystal

(e) With a negative feedback, the returning signal

(i) aids the input signal

(ii) opposes the input signal

(iii) is proportional to output current

(iv) is proportional to differential voltage gain

(f) A Wien bridge is sometimes called a

(i) Notch filter

(ii) Twin-T oscillator

(iii) Phase shifter

(iv) Wheatstone bridge

(g) When there is no base current in a transistor switch, the output voltage from the transistor is

(i) Low

(ii) High

(iii) Unchanged

(iv) Unknown

2. (a) What are Class-C amplifiers ? How do they differ from Class-A and Class-B amplifiers ? 7

(b) Explain why even harmonics are not present in a push-pull amplifier. Give two additional advantages of this circuit over that of a single transistor amplifier. 7

3. (a) Differentiate between the construction and applications of Enhancement type MOSFET and Depletion type MOSFET. 7

(b) For the self-bias circuit shown below, determine the drain current I_D and gate-source voltage (V_{GS}) in Figure 3 (b). 7

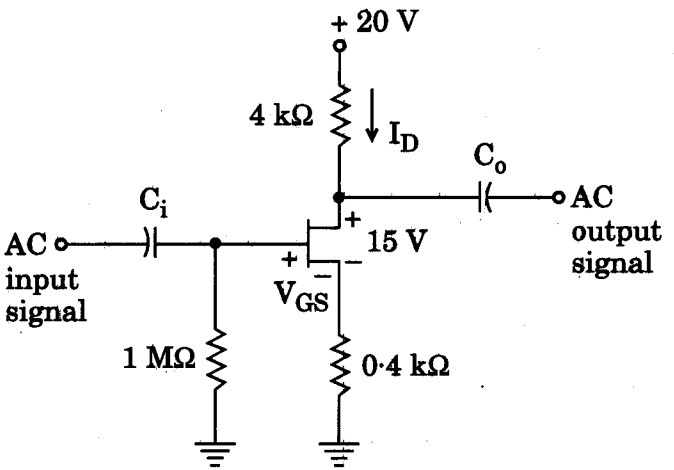
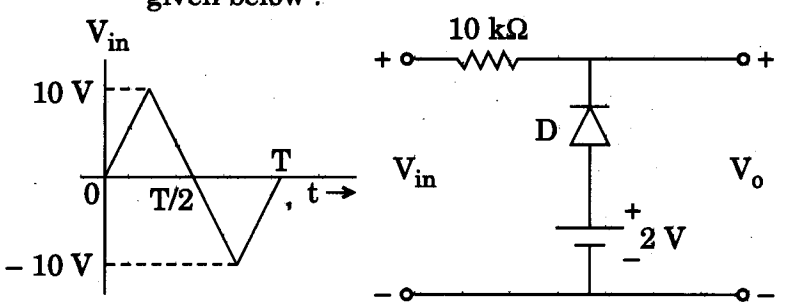


Figure 3 (b)

4. (a) Determine and plot the V_o for the network given below : 6



(b) With the help of a circuit diagram, briefly describe the operation of a positive clamper circuit. What is the role of resistor (R) in the clamping circuit ? 8

5. (a) With the help of a circuit diagram, explain the operation of an astable multivibrator. Justify that it is a two-stage R-C coupled amplifier using feedback. 8

(b) Draw the block diagram of feedback amplifiers in the following configurations :

(i) Voltage series feedback

(ii) Current series feedback

Distinguish between voltage feedback and current feedback in an amplifier circuit, stating the merits of each. 6

6. (a) Explain the working of Colpitts oscillator. Derive an expression for the frequency of oscillation. What are the merits and demerits of this oscillator ? 7

(b) What are the necessary conditions for sustained oscillations ? Why is loop gain in practical oscillators kept slightly greater than unity ? 7

7. (a) What is the necessity of tuned amplifiers ? Explain in brief the advantages of using a double-tuned circuit over a single-tuned circuit. 7

(b) Explain the principles of operation of miller sweep and miller bootstrap circuits with circuit diagrams. 7

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

(a) Exponential Sweep Circuit

(b) RC Integrator Circuit

(c) Hartley Oscillator

(d) Schmitt Trigger and its Applications

(e) Different types of Negative Feedback and their Applications

(f) UJT Relaxation Oscillator

(g) Voltage Variable Resistor (VVR)