DIPLOMA IN ELECTRONICS AND COMMUNICATION ENGINEERING (DECVI/DELVI/DCSVI)

00934

Term-End Examination

June, 2011

BIEL-027 : APPLIED ELECTRONICS

Time : 2 hours *Maximum Marks : 70*

Note : *Question No. **1** is **compulsory.***
*Attempt **any five** Questions.*
*Each Question carry **equal** marks.*

1. This part consists of fill in the blanks, objective type questions and True/False.

(a) An amplifier with negative feedback has _____ bandwidth than (as) the amplifier without feedback. **2**

(b) Full form of MOSFET is called _____ **2**

(c) With feedback β, the overall gain of the circuit is reduced by a factor _____ where A is the gain without the feedback. **2**

(i) β (ii) $A\beta$

(iii) A (iv) $1+\beta A$

(d) For a phase-shift oscillator, the gain of the amplifier stage must be greater than _____ **2**

(i) 19 (ii) 29 (iii) 30 (iv) 1

(e) Which of the following oscillator is tuned oscillator ? 2

(i) Colpitts Oscillator

(ii) Phase-shift Oscillator

(iii) Wein Bridge Oscillator

(iv) Pierce Oscillator

State True or False

(f) In series resonant circuit, at resonant frequency, the circuit impedance is minimum. 2

(g) Field - Effect transistor is a bipolar device that is the current in the device is carried by both electrons and holes. 2

2. (a) How are the power amplifiers classified ? Explain each type. Draw the circuit diagram of a class B push-pull amplifier with its working. 7

(b) What is the significant difference between the construction of an enhancement type MOSFET and depletion type MOSFET ? 7

Show that the transconductance g_m of JFET is related to drain current I_{DS} by

$$g_m = \frac{2}{Vp} \sqrt{I_{DSS}\ I_{DS}}$$

3. (a) What is a tuned amplifier ? What are the objectives or merits served by tuned amplifier ? Compare the frequency response of single tuned and double tuned amplifiers. 7

(b) Explain the meaning of resonance curve. Plot a resonance curve for a parallel tuned circuit and also derive an expression of resonance frequency of a parallel tuned circuit. A parallel resonant circuit has a bandwidth of 15 KHz and Q factor of 120. What is the resonant frequency of the circuit ? 7

4. (a) Discuss the advantages of negative feedback on voltage gain, stability, distortion, bandwidth, output and input impedance of an amplifier, 7

(b) Draw an emitter follower and explain its working. Why it is called emitter follower ? Which type of feedback is being realized in emitter follower ? 7

5. (a) What is Barkhausen criterion for oscillation ? Describe the principle of operation of a Wein Bridge Oscillator and give the condition for sustained oscillation. 7

(b) Explain why : 7

(i) Three RC sections are used in R-C phase shift oscillator with diagram.

(ii) Negative feedback is employed in Wein - Bridge oscillator in addition to usual positive feedback.

(iii) A negative feedback is always employed in high gain amplifiers.

6. (a) (i) What is a Schmitt Trigger ? Why is it called a regenerative comparator ? Define V_{UT}, V_{LT} and hysteresis in Schmitt Trigger 7

(ii) Draw the circuit of astable multivibrator. Explain its working briefly.

(b) Write short notes on : 7

(i) Clampers

(ii) Miller sweep generator

7. (a) What is a differentiator ? How is it different from integrator ? List out the applications of integrator. 7

(b) What is negative resistance generator ? List out the points for the troubleshooting of multivibrators, transistorised sweep generator, clipping and clamping circuits. 7