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**THIRD SEMESTER DIPLOMA EXAMINATION IN ENGINEERING/
TECHNOLOGY — OCTOBER, 2016**

ELECTRONIC DEVICES AND CIRCUITS

(Common for EL, EC and BM)

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer the following questions in one or two sentences. Each question carries 2 marks.

1. Name the various coupling schemes employed in multistage amplifiers.
2. Define Q-factor. Write the expression connecting resonant frequency, Q and bandwidth.
3. Give the expression for gain of an amplifier with negative feedback.
4. Distinguish difference between a BJT and an FET.
5. State the most important feature of crystal oscillators. (5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer *any five* questions from the following. Each question carries 6 marks.

1. Determine the AC load line of a transistor circuit.
2. Compare the various coupling schemes employed in multistage amplifiers.
3. Define a tuned amplifier. Explain why tuned amplifiers cannot be employed for amplification low frequency signals.
4. Compare BJT and JFET.
5. Explain the working of R-C phase shift oscillator using transistor with the help of a circuit diagram. Give the expression for frequency of oscillation.
6. Draw the circuit of a UJT relaxation oscillator and sketch the output waveforms.
7. An astablemultivibrator has component values. $R_1 = R_2 = 20 \text{ K}\Omega$ and $C_1 = C_2 = 100 \text{ pF}$. Calculate the frequency of oscillation. (5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- III (a) Derive the expressions for the following for a common emitter transistor amplifier.
- | | | |
|---------------------|-----------------------|----|
| (i) Input impedance | (ii) Output impedance | 10 |
| (iii) Current gain | (iv) Voltage gain | 5 |
- (b) Explain the fixed biasing with a relevant circuit diagram.

OR

- IV (a) Explain the working of a two stage transformer coupled amplifier with a circuit diagram. 8
- (b) Enumerate the advantages and disadvantages of R-C coupled amplifier. 7

UNIT — II

- V (a) A parallel tuned circuit is resonant at 455KHz and has a 10 KHz bandwidth and $X_L = 1255\Omega$. Find the Q-factor. Calculate the circuit impedance at resonance. 10
- (b) Explain the importance of impedance matching in power amplifiers. 5

OR

- VI (a) Explain the operation of class B push pull amplifier with circuit diagram. 8
- (b) Compare the characteristics of voltage amplifier and power amplifier. 7

UNIT — III

- VII (a) Describe the principle of working of a UJT. 8
- (b) Compare positive and negative feedbacks. 7

OR

- VIII (a) Describe the construction of a depletion type MOSFET. 8
- (b) Explain the effects of negative feedback. 7

UNIT — IV

- IX (a) Explain the working of a Colpitt's oscillator with a circuit diagram. 8
- (b) List the advantages and applications of crystal oscillator. 7

OR

- X (a) Explain the operation of transistorized monostable multivibrator circuit with necessary diagrams. 8
- (b) List the applications of multivibrators. 7