This question paper contains 4 printed pages.]

5192E *Your Roll No. .....*

B.Sc. (Prog.) Physical Sciences / II Sem. B

Paper ELPT-202

Analog Circuits

Time : 3 Hours *Maximum Marks : 75*

(Write your Roll No. on the top immediately on receipt of this question paper.)

*Attempt **five** questions in all.*
*Question No. **1** is compulsory.*

1. Attempt any **five** of the following 3×5

(a) Give one application each of a transistor in CE, CB, CC configuration.

(b) Define load line and quiescent point.

(c) State the merits of a bridge rectifier over a centre tap full wave rectifier.

(d) Define the three stability factors for a transistor amplifier.

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(e) What is thermal runaway? How can it be prevented?

(f) Explain briefly how a transistor (BJT) can work as an amplifier.

(g) Sketch the frequency response of an CE amplifier and identify its bandwidth.

(h) Define CMRR and Slew Rate for an operational amplifier.

2. (a) Draw the block diagram of a regulated power supply and explain the function of each block in detail. 10

(b) Explain the working of a half wave rectifier and derive the expression for its ripple factor. 5

3. (a) Explain the working of a NPN transistor describing its various current components. 10

(b) Draw the input and output characteristics of a CE transistor and label the various regions of operation. 5

4. (a) Classify amplifiers with respect to operating point selection. 5

(b) Explain with the help of a circuit diagram the working of a Class B push pull amplifier and obtain the expression for its efficiency. 10

5. (a) Draw a circuit diagram for a CE transistor amplifier and derive expressions for voltage and current gain and input and output impedance. 10

(b) What is Early effect? What are the effects produced by base width modulation ? 5

6. (a) Explain the working and characteristics of an n-channel enhancement type MOSFET with the help of a well labelled diagram. 10

(b) List the advantages of a FET over BJT. 5

7. (a) List the characteristics of an ideal operational amplifier. 5

(b) Derive the expression of voltage gain for an inverting op-amp with a suitable diagram? 5

(c) Draw the circuit diagram of an op-amp configured as an integrator and obtain an expression for output voltage. 5