M.Sc.(Electronics) (NEP Pattern) Semester-I

NEP-32 / PSCELT102 - Paper-II - Analog and Digital System

P. Pages : 2 **GUG/W/23/15088**

Time : Three Hours * 8 0 1 5 * Max. Marks : 80

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw a neat and labeled diagram and use supporting data wherever necessary.
3. Avoid vague answers and write specific points/answers related questions.

Either:

1. a) What is BJT differential amplifier? Explain construction & working of dual input differential amplifier. **8**

b) What is Multistage Amplifier? Explain working and applications of multistage amplifier. **8**

OR

c) Draw the circuit diagram of two stages RC coupled transistor amplifier. Explain its working. **8**

d) Obtain an expression for Current Gain, Voltage and Power Gain. **8**
In an amplifier, when the signal changes by 0.04 V, the base current changes by $15\mu A$ and collector current changes by 2 mA. If $R_L = 10K$ and $R_C = 8K$, find: (i) Current gain, (ii) Input impedance, (iii) Voltage gain and (iv) Power gain.

Either:

2. a) Explain the use of OPAMP as an (i) Integrator and (ii) Differentiator. **8**

b) Explain the use of OPAMP as (i) a Switching Circuit and (ii) Schmitt trigger circuit. **8**

OR

c) Explain the block diagram of Phase Locked Loop (PLL). **8**

d) State the important characteristics of OPAMP. How you will use OPAMP as an inverting amplifier? State its limitations in inverting mode. **8**

Either:

3. a) What is encoders and decoders? Describe working of 4-bit binary decoder. **8**

b) Map the following expression and simplify them using K-map. **8**

i) $ABC + \overline{A}B\overline{C} + B$

ii) $\overline{A}\,\overline{B}\,\overline{C}\,\overline{D} + \overline{A}B\overline{C}D + ABCD + A\overline{B}C\overline{D}$

OR

c) Explain working of multiplexer and De-multiplexer. **8**

d) Explain working of 4-bit ripple counter. **8**

Either:

4. a) What is digital system design? Explain the concept to design system for control unit. **8**

b) Explain the concept to design system for sequence detector and sequence generator. **8**

OR

c) Explain the working of ring counter with waveforms. **8**

d) Describe PLA with suitable diagram. **8**

5. Solve all questions.

a) Explain frequency response of multistage amplifiers and define the band width. **4**

b) What is a Voltage to Current Converter? **4**

c) What is Mod Counter? Describe working of Asynchronous Mod-7 counter. **4**

d) What is an arithmetic – logic unit (ALU)? Explain its role in digital system. **4**

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