

**PSG COLLEGE OF ARTS & SCIENCE**  
(AUTONOMOUS)  
**BSc DEGREE EXAMINATION DECEMBER 2024**  
(Third Semester)

Branch - **ELECTRONICS**

**DIGITAL AND LINER ICs**

Time: Three Hours

Maximum: 75 Marks

**SECTION-A (10 Marks)**

Answer **ALL** questions

**ALL** questions carry **EQUAL** marks

(10 × 1 = 10)

| Module No. | Question No. | Question                                                                                                                                           | K Level | CO  |
|------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| 1          | 1            | _____ most often used for producing single crystal silicon ingots<br>a). Epitaxial b). Czochralski c). Thermal d). Quartz                          | K1      | CO1 |
|            | 2            | The value of the resistance depends upon the surface _____<br>a). Geometry b). Length c). width d). Area                                           | K2      | CO1 |
| 2          | 3            | RTL circuits consist of resistors and _____<br>a). Diodes b). Capacitors c). Resistors d). Transistors                                             | K1      | CO2 |
|            | 4            | The maximum number of similar logic gates which can be driven by a logic gate is called<br>a). Fan -in b). Coupled c). Fan-Out d). Tri-state logic | K2      | CO2 |
| 3          | 5            | How many pins in IC 741 Op-amp<br>a). 7 b).16 c).9 d).8                                                                                            | K1      | CO3 |
|            | 6            | Summing amplifier used to _____ inputs.<br>a). Added b). Multiply c).Divider d).Integrator                                                         | K2      | CO3 |
| 4          | 7            | Voltage comparator compare with help of<br>a). Input voltage b). Output voltage<br>c).Reference voltage d).Feedback voltage                        | K1      | CO4 |
|            | 8            | Zero crossing detector is also called<br>a).Sinusoid generator b).Saw tooth generator<br>c).Rectangle generator d).Square generator                | K2      | CO4 |
| 5          | 9            | 5 <sup>th</sup> pin of Timer IC 555 is _____<br>a). Control voltage b).Vcc c).Threshold d).Trigger                                                 | K1      | CO5 |
|            | 10           | An important application of PLL is _____<br>a). PWM b). FSK c). PPM d).PAM                                                                         | K2      | CO5 |

Cont...

**SECTION - B (35 Marks)**

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

| Module No. | Question No. | Question                                              | K Level | CO  |
|------------|--------------|-------------------------------------------------------|---------|-----|
| 1          | 11.a.        | What are the steps used in silicon wafer preparation. | K2      | CO1 |
|            |              | (OR)                                                  |         |     |
|            | 11.b.        | Discuss - PN junction Isolation.                      |         |     |
| 2          | 12.a.        | Explain RTL Gate logic.                               | K3      | CO2 |
|            |              | (OR)                                                  |         |     |
|            | 12.b.        | Write about current sourcing and sinking.             |         |     |
| 3          | 13.a.        | Explain the function of an Inverting Amplifier.       | K3      | CO2 |
|            |              | (OR)                                                  |         |     |
|            | 13.b.        | Draw and explain the Summing amplifier.               |         |     |
| 4          | 14.a.        | Describe How the Zero Crossing detector works.        | K4      | CO4 |
|            |              | (OR)                                                  |         |     |
|            | 14.b.        | With a neat diagram explain Wien bridge oscillator.   |         |     |
| 5          | 15.a.        | Explain the working of Digital Phase Detector.        | K4      | CO4 |
|            |              | (OR)                                                  |         |     |
|            | 15.b.        | Discuss how a PLL used as an AM detector.             |         |     |

**SECTION -C (30 Marks)**

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

| Module No. | Question No. | Question                                                                | K Level | CO  |
|------------|--------------|-------------------------------------------------------------------------|---------|-----|
| 1          | 16           | Briefly Explain about Fabrication of Monolithic Resistor.               | K4      | CO4 |
| 2          | 17           | Explain DCTL gate functions.                                            | K4      | CO4 |
| 3          | 18           | Draw and write the working function of Differential amplifier           | K4      | CO4 |
| 4          | 19           | With a neat diagram of 8038 Function Generator – Explain it's function. | K4      | CO4 |
| 5          | 20           | Write a notes on Voltage controlled oscillator with diagram.            | K4      | CO4 |