**Reg. No.** | | | | | | | | |

**G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.**

**UG DEGREE END SEMESTER EXAMINATIONS - NOVEMBER 2024.**

(For those admitted in June 2021 and later)

**PROGRAMME AND BRANCH: B.Sc., PHYSICS**

| SEM | CATEGORY | COMPONENT | COURSE CODE | COURSE TITLE |
|---|---|---|---|---|
| V | PART - III | CORE | U21PH508 | FUNDAMENTALS OF ELECTRONICS |

**Date & Session: 05.11.2024/FN** **Time: 3 hours** **Maximum: 75 Marks**

| Course Outcome | Bloom's K-level | Q. No. | **SECTION – A (10 X 1 = 10 Marks)**<br>**Answer ALL Questions.** |
|---|---|---|---|
| CO1 | K1 | 1. | Give an example for current source.<br>a) alternator b) generator c) battery d) photovoltaic cell |
| CO1 | K2 | 2. | _____ represents the relationship between voltage and current in a two-port network.<br>a) o-parameter b) n-parameter c) h-parameter d) m-parameter |
| CO2 | K1 | 3. | A crystal diode is used as a/an _____.<br>a) oscillator b) amplifier c) filter d) rectifier |
| CO2 | K2 | 4. | A _____ allows ac and blocks dc.<br>a) capacitor b) inductor c) transistor d) transformer |
| CO3 | K1 | 5. | The built- in- potential of a silicon diode at room temperature is _____.<br>a) 0.7 V b) 0.3 V c) 1 V d) 10 V |
| CO3 | K2 | 6. | The electric power is given by, P = _____.<br>a) i/R b) $i^2R$ c) R/i d) $R^2i$ |
| CO4 | K1 | 7. | The operation of a bistable multivibrator is identical to that of a _____.<br>a) register b) flip-flop c) converter d) counter |
| CO4 | K2 | 8. | RC phase shift oscillators contain a minimum of _____ phase shift network.<br>a) three b) two c) one d) zero |
| CO5 | K1 | 9. | The _____ amplifier amplifies the difference between two input signals.<br>a) log b) antilog c) differential d) buffer |
| CO5 | K2 | 10. | The maximum rate at which the output voltage can change within its linear region is known as _____ of the op-amp.<br>a) closed loop gain b) open loop gain c) slew rate d) CMRR |
| **Course Outcome** | **Bloom's K-level** | **Q. No.** | **SECTION – B (5 X 5 = 25 Marks)**<br>**Answer ALL Questions choosing either (a) or (b)** |
| CO1 | K3 | 11a. | Explain the maximum power transfer theorem.<br>**(OR)** |
| CO1 | K3 | 11b. | Develop the procedure for finding Norton equivalent circuit. |
| CO2 | K3 | 12a. | Describe an experiment to draw the VI characteristics of a zener diode.<br>**(OR)** |
| CO2 | K3 | 12b. | Find an expression for efficiency of a half wave rectifier. |

| | | | |
|---|---|---|---|
| CO3 | K4 | 13a. | Analyze the action of transistor with neat circuit diagram.<br>**(OR)** |
| CO3 | K4 | 13b. | Examine the function of Class B power amplifier. |
| CO4 | K4 | 14a. | Explain Barkhausen conditions for an oscillation.<br>**(OR)** |
| CO4 | K4 | 14b. | Assess the clipping circuits with necessary input and output waveforms. |
| CO5 | K5 | 15a. | Infer the application of op-amp as an integrator with its input and output waveforms.<br>**(OR)** |
| CO5 | K5 | 15b. | Elaborate in detail about the high pass filter with neat diagram. |

| **Course Outcome** | **Bloom's K-level** | **Q. No.** | **SECTION – C (5 X 8 = 40 Marks)**<br>**Answer ALL Questions choosing either (a) or (b)** |
|---|---|---|---|
| CO1 | K3 | 16a. | Briefly explain the conversion of voltage source into current source.<br>**(OR)** |
| CO1 | K3 | 16b. | Illuminate Thevenin's theorem with an example. |
| CO2 | K4 | 17a. | Derive an expression for the efficiency of a bridge rectifier with neat sketch.<br>**(OR)** |
| CO2 | K4 | 17b. | Infer the operation of capacitor and choke input filter. |
| CO3 | K4 | 18a. | Analyze the characteristics of JFET in detail.<br>**(OR)** |
| CO3 | K4 | 18b. | Examine the function of RC coupled amplifier with neat diagram. |
| CO4 | K5 | 19a. | Predict the function of Hartley oscillator and obtain its frequency.<br>**(OR)** |
| CO4 | K5 | 19b. | Assess the operation of an a stable multivibrator with neat diagram. |
| CO5 | K5 | 20a. | Draw an op-amp circuit whose output is $V_0 = -(V_1+V_2+V_3)$.<br>**(OR)** |
| CO5 | K5 | 20b. | (a) Derive an expression for the voltage gain of non-inverting amplifier with neat diagram.<br>(b) In a non-inverting amplifier, let $R_1 = 5k\Omega$, $R_f = 20k\Omega$ and $V_i = 1V$. A load resistor of $5k\Omega$ is connected at the output. Calculate the output voltage. |