

Hall Ticket Number:

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Code No. : 13648 S O

**VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD***Accredited by NAAC with A++ Grade***B.E. (I.T.) III-Semester Supplementary Examinations, August-2022****Basic Electronics**

Time: 3 hours

Max. Marks: 60

*Note: Answer all questions from Part-A and any FIVE from Part-B***Part-A (10 × 2 = 20 Marks)**

| Q. No.                           | Stem of the question   | M | L | CO | PO |
|----------------------------------|--|---|---|----|----|
| 1.                               | Distinguish between forward bias and reverse bias of a diode.  | 2 | 1 | 1  | 1  |
| 2.                               | State the application of a diode that specifically operates in reverse break down region.  | 2 | 1 | 1  | 1  |
| 3.                               | List out the different modes of operation of a BJT.  | 2 | 1 | 2  | 1  |
| 4.                               | Distinguish between the three configurations of a BJT.   | 2 | 1 | 2  | 1  |
| 5.                               | Draw the circuit symbols of NMOS and PMOS transistors.   | 2 | 1 | 3  | 1  |
| 6.                               | Draw the circuit of a CMOS NOT gate.   | 2 | 1 | 3  | 1  |
| 7.                               | State the Barkhausen's criteria of oscillations.   | 2 | 1 | 4  | 1  |
| 8.                               | List the advantages of negative feedback.  | 2 | 1 | 4  | 1  |
| 9.                               | List the ideal characteristics of an operational amplifier.  | 2 | 2 | 5  | 1  |
| 10.                              | Draw the pin diagram of Op Amp, labeling all the pins.   | 2 | 2 | 5  | 1  |
| <b>Part-B (5 × 8 = 40 Marks)</b> |  |   |   |    |    |
| 11. a)                           | Explain the V-I characteristics of a diode. Also give the diode current equation and explain the terms involved.                       | 4 | 2 | 1  | 1  |
| b)                               | Draw and explain the operation of a bridge rectifier circuit.  | 4 | 2 | 1  | 1  |
| 12. a)                           | List out the different biasing circuits of a BJT. Derive the expression of stability factor for a voltage divider bias circuit of BJT. | 4 | 2 | 2  | 1  |
| b)                               | Draw the h parameter equivalent circuit of a BJT in common emitter configuration and define the different h parameters involved.       | 4 | 2 | 2  | 1  |
| 13. a)                           | Implement two input NAND gate using CMOS transistors and explain its operation.  | 4 | 3 | 3  | 1  |
| b)                               | Compare the various digital integrated circuit logic families.   | 4 | 2 | 3  | 1  |

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|--------|---|---|---|---|---|
| 14. a) | Draw the circuit diagram of Hartley oscillator and derive the expression of its frequency of oscillation.     | 4 | 3 | 4 | 1 |
| b)     | Derive the expression for loop gain of a negative feedback amplifier.   | 4 | 3 | 4 | 1 |
| 15. a) | Explain the operation of a square wavegenerator using an Op Amp and derive an expression for its frequency.   | 4 | 3 | 5 | 1 |
| b)     | Derive an expression of output voltageof an integrator circuit constructed using an Op Amp.                   | 4 | 3 | 5 | 1 |
| 16. a) | With neat circuit diagram explain the operation of a positive clamping circuit.                               | 4 | 3 | 1 | 1 |
| b)     | Derive the relationship between the large signal current gain of a common base and common emitter transistor. | 4 | 3 | 2 | 1 |
| 17.    | Answer any <i>two</i> of the following:   |   |   |   |   |
| a)     | Explain the physical structure of CMOS transistor.  | 4 | 2 | 3 | 1 |
| b)     | Draw and explain the operation of a RC phase shift oscillator.  | 4 | 2 | 4 | 1 |
| c)     | Draw the circuit diagram and derive the output of a log amplifier constructed using Op Amp.                   | 4 | 3 | 5 | 1 |

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

|      |                               |     |
|------|-------------------------------|-----|
| i)   | Blooms Taxonomy Level – 1     | 20% |
| ii)  | Blooms Taxonomy Level – 2     | 40% |
| iii) | Blooms Taxonomy Level – 3 & 4 | 40% |