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Code No. : 13207

**VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**  
**B.E. (CSE: CBCS) III-Semester Main Examinations, December-2017**

**Introduction to Electronics Engineering**

Time: 3 hours

Max. Marks: 70

*Note: Answer ALL questions in Part-A and any FIVE from Part-B*

**Part-A (10 × 2 = 20 Marks)**

1. Analyze the potential barrier of a PN junction.
2. Write the principle of working of full wave rectifier.
3. What are the operating regions of a transistor?
4. Briefly discuss the phenomenon of Zener breakdown.
5. List out the advantages of introducing negative feedback in amplifiers.
6. State the Barkhausen's criteria for sustained oscillations.
7. List the ideal characteristics of an op-amp.
8. Draw the circuit diagram of a voltage follower using an op-amp.
9. Write the constructional details of a Thermocouple.
10. Differentiate between DIAC and TRIAC.

**Part-B (5 × 10 = 50 Marks)**

*(All bits carry equal marks)*

11. a) Differentiate between
  - i) Transition and diffusion capacitances of a PN diode.
  - ii) Drift and diffusion currents of a PN diode.b) A half wave rectifier, having  $R_L$  of 1000  $\Omega$ , rectifies an alternating voltage of 325 V peak value and diode has a forward resistance of 100  $\Omega$ . Calculate
  - i) Peak, average and rms values of currents
  - ii) DC power output
  - iii) AC input power
  - iv) Efficiency of a rectifier.
12. a) With a neat constructional diagram, explain the working of N-channel JFET.  
b) With necessary illustrations explain the functioning of a Zener diode as a voltage regulator.
13. a) With a neat sketch, explain the working principle of Colpitt's oscillator.  
b) Give a broad classification of oscillators.
14. a) What are the different open loop and closed loop op-amp configurations? Compare and contrast.  
b) Design half subtractor and full subtractor using logic gates along with Boolean expressions and truth tables.
15. a) Explain in detail about Piezoelectric transducer and Photoelectric transducer?  
b) Discuss in detail the constructional details of CRO?
16. a) Differentiate static and dynamic resistances of a PN diode with the help of its VI characteristics.  
b) Define the four hybrid parameters of a BJT in CB configuration. Also draw its equivalent circuit.
17. Answer any *two* of the following:
  - a) Explain RC phase shift oscillator along with its merits and demerits.
  - b) With the help of necessary diagrams, explain the working of LVDT.
  - c) Write about the classification of Transducers.

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14. a) Explain how the efficiency and regulation of transformer are obtained by Sumpner's test [4]  
with a neat schematic.
- b) A 400 kVA transformer with per phase impedance of  $0.01+j0.05$  p.u. operates in parallel with a 200 kVA transformer with per phase impedance of  $0.012+j0.04$  p.u. Obtain the load shared by each transformer for a total load of 600 kVA at 0.8 power factor lagging. [6]
15. a) Explain the process of conversion from three phase to two phase in transformers with relevant diagrams. [5]
- b) A 3- $\Phi$  transformer is used to step-down the voltage of a 3- $\Phi$ , 11kV feeder line, per phase turns ratio is 12. For a primary line current of 20A calculate the secondary line voltage, line current, output kVA for the following connections a) Y-  $\Delta$  b)  $\Delta$  - Y. [5]
16. a) Explain the principle of energy conversion in electromechanical system. [5]
- b) Explain about armature reaction in DC machines. [5]
17. Answer any *two* of the following:
- a) Explain the procedure with a neat circuit diagram for separation of no-load losses in a DC motor. [5]
- b) Draw the per phase equivalent circuit of a transformer referred to primary. [5]
- c) Explain about no-load tap changing phenomenon in transformers. [5]

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