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Code No.: 22415 AS

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
B.E. (Mech. Engg.) II Year II-Semester Advanced Supplementary Examinations, June/July-2017

Applied Electronics

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. Bring out the significance of Hall Effect in semiconductors.
2. Distinguish between static & dynamic resistance of a PN junction diode.
3. Derive the efficiency of a half wave rectifier.
4. Explain the working principle of a photo diode.
5. State Barkhausen's criteria for sustained oscillations in an oscillator.
6. In a CB configuration, the current amplification factor is 0.9. If the emitter current is 1 mA, determine the value of base current of the transistor.
7. Draw the circuit diagram of a summing amplifier using Op-Amp.
8. Realize basic AND and OR logic gates using minimum number of NAND gates only.
9. Sketch the Program Status Word (PSW) format of 8051 microcontroller and write the significance of each bit.
10. Describe the memory address allocations of internal RAM of 8051 microcontroller.

Part-B (5 × 10 = 50 Marks)

11. a) Define the following terms with respect to semiconductors: [4]
i) Forbidden energy gap ii) Acceptors iii) Donors iv) Mobility
- b) What is voltage regulation? Describe the line and load regulation phenomena in Zener diode. [6]
12. a) With neat circuit diagram, explain the operation of half wave rectifier, with π section filter. [5]
- b) A half wave rectifier, having a resistive load of 1000 Ω , rectifies an alternating voltage of 325 V peak value and the diode has a forward resistance of 100 Ω . Calculate: [5]
i) Peak, average and rms values of current ii) DC power output
iii) AC power input iv) Efficiency of the rectifier
13. a) Compare common base and common emitter configurations of NPN transistor with respect to the circuit diagrams and input/output characteristics. [6]
- b) An amplifier has voltage gain with feedback, of 100. If the gain without feedback changes by 20 %, and the gain with feedback should not vary more than 2 %, determine the value of open loop gain A and feedback ratio β . [4]
14. a) Design full adder logic circuit using basic logic gates. [4]
- b) Operational amplifier acts as an integrator and a differentiator. Justify by obtaining the corresponding expressions. [6]

15. a) Explain the construction and working of LVDT. [6]
b) Explain any four addressing modes of 8051 with an example for each. [4]
16. a) With a neat circuit diagram and V-I characteristics, explain the working of UJT. [6]
b) Discuss the necessity and types of electronic filters used at the output of rectifiers. [4]
17. Answer any *two* of the following:
- a) RS flip/flop [5]
 - b) Internal block diagram of 8051 microcontroller [5]
 - c) Colpitt's oscillator. [5]
