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SEAT No. _____

No. of printed pages: 02

SARDAR PATEL UNIVERSITY
M.Sc. (PHYSICS) Second Semester Examination
Day & Date: Tuesday & 26/03/2019
Time: 02:00 P.M. to 05:00 P.M.
Title: ANALOG AND DIGITAL ELECTRONICS
SUBJECT CODE: PS02EPHY01

Instruction: Figures to the right indicate marks.

Total marks: 70

Q.1 Write answers of all questions by showing your choice against the question [8] number.

- (1) The reverse recovery time of a diode arises due to the _____.
(a) majority carriers in the depletion region (b) minority carriers in the depletion region
(c) majority carriers in the n- & p- regions (d) minority carriers in the n- & p- regions.
- (2) The LED works on the principle of _____.
(a) electroluminescence (b) photoluminescence
(c) chemiluminescence (d) thermoluminescence
- (3) If Germanium diode is used as switch and is in ON (closed) condition, what will be the voltage drop at the switch;
(a) 0.3V (b) 0.7V (c) 0V (d) infinite
- (4) Typical value of reverse recovery time of a switching diode ranges between;
(a) 4ns to 50ns (b) 50ns to 100ns (c) 4 ms to 50ms (d) 50ms to 100ms
- (5) The input block of IC 565 is _____.
(a) VCO (b) Low Pass Filter (c) Phase Shifter (d) None of these
- (6) RAM is a _____ Memory.
(a) Volatile (b) Non Volatile (c) Permanent (d) All of these
- (7) To access 1K Bytes Memory total number of address lines required are _____.
(a) 10 (b) 11 (c) 12 (d) 13
- (8) For an 8 bit ADC resolution is _____.
(a) 2^8 (b) 2^7 (c) 2^8-1 (d) $1/2^8-1$

Q.2 Attempt any Seven of the followings:

[14]

- (1) With suitable circuit diagram explain zero crossing detector.
- (2) How is diode used as a clipper?
- (3) Discuss the reason for appearance of reverse recovery time?
- (4) With a neat diagram showing its input-output waveforms explain clamper circuit to clamp output at approximately +4V maximum.
- (5) With necessary circuit diagram and waveform explain series noise clipper.
- (6) Define: Minterms and Maxterms.

(1)

(P.T.O)

- (7) Explain principle of Tri-state logic.
- (8) Distinguish between Asynchronous and Synchronous counter.
- (9) Explain Half Adder.
- Q.3(a) With neat diagram explain the construction and working of solar cell. In which quadrant of I-V characteristics the solar cell works and why? [6]
- Q.3(b) Draw and discuss the construction of SCR. Draw the equivalent circuit diagram and explain the ON and OFF state condition of SCR. [6]

OR

- Q.3(b) Draw and discuss the construction of UJT. Draw the equivalent circuit diagram and explain the UJT static emitter characteristic. [6]
- Q.4(a) Explain the internal construction of IC-555. Discuss its application as an Astable multivibrator. [6]
- Q.4(b) Expand $\overline{A + B}$ to min terms and max terms. [6]

OR

- Q.4(b) Assuming 4 variables, discuss the Karnaugh Mapping method for reducing the Boolean express. [6]
- Q.5(a) Discuss the working principle of Multiplexer with suitable schematics. Write its applications. [6]
- Q.5(b) Classify different types of Memory. Explain any one type of Memory. [6]

OR

- Q.5(b) Explain working of 3-line to 8-line decoder with the help of logic diagram and truth table. [6]
- Q.6(a) Discuss in detail with proper schematics any one method of Digital to Analog Converter. [6]
- Q.6(b) Explain the block diagram of Intel 8085 Microprocessor. What is the function of ALE pin in 8085? [6]

OR

- Q.6(b) Describe Timing and Control unit in context with the 8085. [6]