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SEAT No._____ No. of Printed Pages : 2

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SARDAR PATEL UNIVERSITY

M.Sc. (PHYSICS) (II[nd] Semester) Examination

Tuesday, 30[th] October, 2018. Time:10:00 am to 1:00 pm.

Course No.: PS02EPHY01: ANALOG AND DIGITAL ELECTRONICS

Notes: **Q.1:** Eight multiple choice questions (MCQ) carrying one mark each.
Q.2: Short answer questions carrying two marks each (attempt any seven out of nine).
Q.3 to Q.6: Long answer questions carrying 12 marks each.

Total Marks:70

Q.1(i) Which of the following wave shaping circuit removes approximately half portion of the input wave? **(8)**
(a) Clamper **(b)** clipper **(c)** amplifier **(d)** attenuator.

(ii) Which of the following is a photonsensitive device?
(a) UJT **(b)** Op-Amp **(c)** SCR **(d)** LDR

(iii) Which of the following ICs has VCO as one of its block?
(a) IC-741 **(b)** IC-555 **(c)** IC-565 **(d)** IC-8085

(iv) The Gray code number 1101 is equivalent to the binary number
(a) 1001 **(b)** 1101 **(c)** 1111 **(d)** 1110

(v) Which of the following circuits is used to connect one input to different output channels?
(a) De-Multiplexer **(b)** Multiplexer **(c)** Comparator **(d)** None

(vi) For reprogramming of EPROM, the stored programme can be erased by application of _____ .
(a) e-beam **(b)** X-rays **(c)** UV-rays **(d)** none

(vii) Which of the following circuit is a faster ADC?
(a) Counter type **(b)** weighted resistor type
(c) Successive approximation type **(d)** none

(viii) The data bus of a microprocessor 8085 is of _____bits wide.
(a) 4 **(b)** 16 **(c)** 32 **(d)** 8.

Q.2(a) What is the function of an Op-Amp comparator? Discuss in brief. **(14)**

(b) Differentiate between LDR and photodiode.

(c) What are Min term and Max term? Define.

(d) What is an Eccess-3 code? State its important features.

(e) Differentiate between combinational and sequential circuits giving suitable examples.

(f) What is the role of a decoder circuit in a digital system? Explain in brief.

(g) State the similarities and differences between ROMs and RAMs.

(h) Explain how successive approximation method is used for ADC.

(i) Sketch the pin diagram of microprocessor IC-8085.

(PTO)

Q.3(a) Describe the diode clamping circuits and mention their applications. (6)

(b) Explain the functioning of an IC-741 based comparator in detail. (6)

OR

(b) What is UJT? Why it is called uni-junction device? Describe the operation of UJT and define intrinsic stand-off ratio. (6)

Q.4(a) Discuss in detail about Karnaugh Mapping. (6)

(b) With the help of neat block diagram and output waveforms explain the working of IC-555. (6)

OR

(b) Explain the operation of PLL IC-565 using its block diagram. Also mention its important applications. (6)

Q.5(a) Explain the operation of encoder and decoder circuits with the help of neat circuit diagram. (6)

(b) Explain in detail about half adder and full adder circuits. What are their applications? (6)

OR

(b) Discuss semiconductor ROM in detail. (6)

Q.6(a) Discuss in detail about various registers of microprocessor IC-8085. (6)

(b) Write down the methods used for ADC and explain any one in detail. (6)

OR

(b) Sketch the internal block diagram of Microprocessor IC-8085 and explain the functions of (i) timing and control unit and (ii) data and address bus. (6)