Seat No.	

[5352]-543

S.E. (Electrical Engineering) (First Semester)

EXAMINATION, 2018

ANALOG AND DIGITAL ELECTRONICS

(2015 PATTERN)

Time : Two Hours　　　　　　　　　　Maximum Marks : 50

N.B. :— (i) Solve question Nos. Q. **1** or Q. **2**, Q. **3** or Q. **4**, Q. **5** or Q. **6**, Q. **7** or Q. **8**.

(ii) Figures to the right indicate full marks.

(iii) Neat diagram must be drawn wherever necessary.

(iv) Use of calculator is allowed.

(v) Assume suitable data if necessary.

1. (a) Explain binary number in detail give the difference between binary number system and BCD. [6]

    (b) Show the 8-bit subtraction of the following decimal numbers in 2's complement form : [6]

    (i) +22, +17

    (ii) +17, +22

Or

2. (*a*) Simplify the following expression using K-map : [6]

$f(A, B, C, D) = \Sigma m(1, 2, 3, 5, 7, 8, 9, 11, 14)$

(*b*) With the help of neat circuit diagram, explain the operation of ring counter. If the initial data loaded is $(0001)_2$ then draw timing diagram for the same. [6]

3. (*a*) Design and explain the operation of MOD 10 asynchronous counter with timing diagram. [7]

(*b*) Explain the working of JK flip-flop with trurh table. [6]

Or

4. (*a*) Explain the difference between fixed and variable regulator. Explain with suitable circuit diagram, how IC-317 can act as variable voltage regulator. Also derive formula for variable voltage available at the output of IC LM 317 in terms of circuit parameters.

[7]

(*b*) Draw neat diagram and explain IC 555 as Astable multivibrator.

[6]

5. (*a*) Explain with neat connection diagram first order low pass filter. Also explain its frequency response. [6]

(*b*) Draw neat diagram and explain direct coupled amplifier. Give its applications. [6]

Or

6. (*a*) Draw and explain transfer characteristics and drain characteristics of FET. [6]

(*b*) Explain Push pull amplifier with waveforms, applications. [6]

7. (*a*) Discuss relative merits and demerits of R-C coupled, Transformer coupled and direct coupled multistage amplifiers. Draw their frequency response curve. [6]

(*b*) With the help of circuit diagram and relevant waveforms explain the operation of single-phase full wave bridge rectifier with resistive load. [7]

Or

8. (*a*) A 220V, 50Hz AC voltage is applied to the primary of $4:1$ step down transformer, which is used in bridge rectifier, having a load resistance of 1 K ohm. Assuming the diode to be an ideal, determine the following : DC output voltage, DC output current and DC power delivered to the load. A single-phase half wave uncontrolled rectifier is connected to an RL load. [6]

(*b*) Draw diagram and derive an expression for the Idc, Vdc. [7]