Seat	
No.	9,00

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## S.E. (Electrical) (I Sem.) EXAMINATION, 2018 ANALOG AND DIGITAL ELECTRONICS (2015 PATTERN)

Time: Two Hours

Maximum Marks: 50

N.B. :— Attempt Q. No. 1 or 2, Q. No. 3 or 4, Q. No. 5 or 6, Q. No. 7 or 8.

- 1. (a) Perform the following arithmetic operations: [6]
  - (1) Add 37 and 46 BCD numbers
  - (2) Subtract using 2's Complement:

11011 - 10100

- (b) (1) Convert the following number into desired base  $(630.4)_8 \, \rightarrow (?)_{10}$ 
  - 2. Convert  $(2345)_{10}$  in BCD and Excess-3 code. [6] Or
- 2. (a) With the help of a 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]
  - (b) Convert  $A\overline{B}C + BCD + ACD + \overline{A}B$  into POS form using K-Map. [6]

P.T.O.

- 3. (a) Explain the difference between fixed and variable regulator.

  Draw suitable circuit diagram of IC-317 and derive formula for variable voltage available at the output in terms of circuit parameters. [7]
  - (b) Write a short note on V to I converter with grounded type load. [6]

Or

- 4. (a) Design a low pass filter at a cut-off frequency of 1 kHz with passband gain of 2. Assume [C = 0.01 microfarad] [7]
  - (b) Draw neat diagram and explain IC 555 as Astable multivibrator. [6]
- **5.** (a) Explain direct coupled amplifier. Why direct coupling amplifier is not suitable for amplification of high frequencies signals? [6]
  - (b) What is DC load line? Derive equation for DC load line and show Q point on DC load line. [6]

Or

- **6.** (a) Draw construction of FET and explain transfer characteristics and drain characteristics of FET. [6]
  - (b) Discuss relative merits and demerits of R-C coupled, transformer coupled and direct coupled multistage amplifiers. Draw their frequency response curve. [6]
- 7. (a) Compare the performance of half-wave rectifier and full wave uncontrolled rectifier. [6]

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- (b) Draw the circuit diagram and state the expression of the following for the 1-phase full wave Center tap rectifier: [7]
  - (1) Average output voltage
  - (2) RMS output voltage
  - (3) Ripple factor.

Or

- 8. (a) A three-phase bridge uncontrolled rectifier is connected to an R load. Draw neat diagram and explain with waveforms. [6]
  - (b) A voltage of 220 sin (100  $\pi$ t) is applied to a half-wave rectifier with a load resistance 10 k-ohm. Calculate the maximum current, rms cuffent, average current, ac power input, dc power output and ripple factor. [7]

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