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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 :
(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. 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.
(b) Convert $\mathrm{A} \overline{\mathrm{B}} \mathrm{C}+\mathrm{BCD}+\mathrm{ACD}+\overline{\mathrm{A} B}$ into POS form using K-Map.
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.
(b) Write a short note on V to I converter with grounded type load.

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

## Or

6. (a) Draw construction of FET and explain transfer characteristics and drain characteristics of FET.
(b) Discuss relative merits and demerits of R-C coupled, transformer coupled and direct coupled multistage amplifiers. Draw their frequency response curve.
7. (a) Compare the performance of half-wave rectifier and full wave uncontrolled rectifier.
(b) Draw the circuit diagram and state the expression of the following for the 1 -phase full wave Center tap rectifier :
(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 $220 \sin (100 \pi \mathrm{t})$ 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.

