Code No: H4301/R13

M. Tech. II Semester Regular/ Supplementary Examinations, July-2016
SWITCHED MODE POWER CONVERSION
(Common to PE, P & ID, PE & ED, PE & D, EM & D and PE & PS)

Time: 3 Hours   **Max. Marks: 60**

Answer any FIVE Questions
All Questions Carry Equal Marks

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1. a Obtain the input-output voltage and current relation as a function of duty ratio for a Buck-   5
       Boost dc-dc converter in continuous conduction mode.
   b Design a Buck converter to produce an output voltage of 18V across 10Ω load resistance.   7
       The output voltage ripple must not exceed 0.5 percent. The DC supply is 48V. Design for
       continuous inductor current. Find out the duty ratio, the values of inductance and capacitor.

2.   Explain the principle and operation of ZCS resonant switch converters with neat diagrams.   12

3. a What is meant by ZVS and ZCS? List the various classifications of resonant converters.   6
   b A parallel resonant dc-dc converter has Vs=150V, L_r=10μH, C_r=0.42μF, R_L=10Ω and   6
       f_s=120kHz.Determine the output voltage of the converter. Assume the output filter
       components and produce the ripple free output current and voltage.

4. a Briefly explain about electrical isolation in feedback loop.   5
   b Explain the principle operation of a push-pull converter with neat diagrams.   7

5. a Explain in brief about forwarded converter operation with suitable diagrams.   6
   b Briefly explain about control scheme for resonant converters with help of diagram.   6

6. a Briefly explain about DC inductor and capacitor design considerations.   6
   b What are the closed loop control requirements in switch mode converter? Explain.   6

7. a Briefly explain the choice of the switching frequency of isolated switch mode converters.   4
   b Obtain the gain and phase plot of the non-ideal boost converter from its transfer function.   8

8.   Write short notes on:
   a Small–signal analysis and linearization.   6
   b Large signal issues in voltage-mode and current-mode control.   6