QP Code : **MV-18074**

(3 Hours) [Total Marks : 100

N. B. : (1) Question No. **1** is **compulsory**.
   (2) Solve any **four** questions of remaining **six** questions.
   (3) **Assume** suitable **data** if **necessary**.

1. Answer any **four** :- 20
   (a) Why S parameters are used at microwave frequencies ?
   (b) TEM waves do not propagate through hollow waveguide. Justify.
   (c) An IMPATT diode has following parameters :-
       Carrier drift velocity $\upsilon d = 2 \times 10^7$ cm/s
       Drift region length L = 6μm
       Maximum operating voltage $V0_{max} = 100V$
       Maximum operating current $T0_{max} = 200$ mA
       Efficiency $\eta = 15\%$
       Breakdown voltage Vbd = 90V.
       Find :-
       (i) The maximum power in watts.
       (ii) The resonant frequency.
   (d) What is back heating in microwave oscillator ?
   (e) Differentiate between TE_{mn} and TM_{mn} modes in rectangular waveguides.

2. (a) Derive wave equation for TE wave and obtain all field components in rectangular wave guide. 12
   (b) Define group velocity and phase velocity for wave propagating in rectangular waveguide. 8
       A wave guide has cutt off frequency of 3.75 GHz. Find the group velocity for this rectangular waveguide at 5 GHz.

3. (a) With neat schematic diagram, explain the bunching of electrons in Reflex Klystron. Hence derive the expression for bunching parameter. 10
   (b) A pulsed cylindrical magnetron is operated with following parameters :- 10
       Anode voltage = 25 kV
       Beam current = 25 A
       Magnetic flux density = 0.34 wb/m²
       Radius of cathode cylinder, a = 5 cm
       Radius of vane edge to center, b = 10 cm
       Calculate :-
       (a) The cyclotron angular frequency
       (b) The cutt off voltage
       (c) The cutt off magnetic flux density.

Con. 9617-14. [TURN OVER

4. (a) What are ferrite devices ? Explain with neat schematic circulator and mention its uses.   10

   (b) Explain a method to measure VSWR at microwave frequencies when VSWR is greater than 10.   10

5. (a) Explain the different operating modes of Gunn diode.   10

   (b) With neat diagram explain the operation of Travelling Wave Tube.   10

6. (a) Explain the operation of two hole directional coupler. Derive its S-matrix.   10

   (b) Explain power frequency limitation in microwave transistors.   10

7. Write short notes on (any **four**) :-   20
   - (a) Measurement of power
   - (b) Microwave resonator
   - (c) Magic TEE
   - (d) Striplines
   - (e) Applications of microwaves

QP Code : MV-18121

(3 Hours)   **[Total Marks : 100**

N.B. : (1) Question No. one is compulsory.
        (2) Attempt any four from remaining six questions.

Q1 a) Design the 8086 microcomputer system with the following specifications

     i) 8086 CPU operating at 5MHz

     ii) 8087 co-processor for numeric computation

     iii) 32 KB of EPROM using 8 KB devices

     iv) 64 KB of SRAM using 16k devices

     v) 2 input and 1 output port all are of 16 bits.   15 marks

b) Explain address modes of 8086 microprocessor   5 marks

Q. 2a) Draw and explain functional block diagram of 8257. Explain the bit configuration of mode set register and status register of 8257.   10 marks

    b) Draw and explain the interfacing diagram of 8259 in maximum mode and cascaded mode with 8086 microprocessor   10 marks

Q3 a) Convert the decimal number -187.625 into short real, long real and temporary real data of 8087 NDP.   5 marks

b) Explain different 8087 exceptions   5 marks

c) Write function of the following 8086 microprocessor pins

     i) LOCK (bar) ii) QS0 & QS1 (bar) iii) MN/MX (bar)

   iv) TEST (bar) v) READY   10 marks

Q4 a) Explain the application of timer in PIC18F microcontroller   5 marks

   b) Explain addressing modes of PIC 18F   5 marks

   c) How the data memory and program memory is organized with PIC18F. Explain with the help of memory map.   10 marks

Q 5 a) write PIC 18F assembly program to blink a LED   10 marks

   b) write a short note on : PIC 18 Reset   10 marks

P.V.P.P. COLLEGE OF ENGG.
20 MAY 2014
SION, MUMBAI-22

Q 6 a)Write algorithm for bubble sort and an assembly language program to sort a given set of 8 bit unsigned integers into ascending order by bubble sort .

10 marks.

   b) write an assembly language program to find maximum number in the array of 12 numbers.   10 marks

Q. 7 Write short notes

 a) Assembler directives for 8086   7marks

 b)Handshaking mode of 8255PPI   7 marks

 c)Configuration of 8259 OCWS   6 marks

Con. 10843-14.

QP Code : MV-18164

(3 Hours) [Total Marks : 100

N.B. : (1) Questions No. **1** is **compulsory**.
  (2) **Attempt** any **four** questions out of **remaining six** questions.
  (3) **Figures** to the **right** indicate **full** marks.

1. Attempt any **four** of the following :—
  (a) What is signal conditioning ? Why is it necessary in Data Acquisition System ? 5
  (b) What are the basic requirements of a transducer. 5
  (c) Define the term Accuracy and Precision. Give suitable example. 5
  (d) What are different types of error ? 5
  (e) Give need of Instrument calibration. 5

2. (a) Derive the expression for step response of first order instrumentation system and explain its response. 10
  (b) Explain the construction, working principle and operation of Electromagnetic type of flow meter. 10

3. (a) What is LVDT ? State the specifications and Limitations of this transducer. Also compare RVDT with LVDT. 10
  (b) Explain the working of Strain Gauge. Derive the expression of gauge factor for metal strain gauge. Also compare Semiconductor Strain Gauge with metal strain gauge. 10

4. (a) With the help of neat diagram explain the working of Instrumentation amplifier and derive its expression. Also explain its advantages. 10
  (b) Explain window comparator ? Give its application. 10

5. (a) Explain multichannel Data Acquisition System to monitor temperature, pressure and Displacement measurement. 10
  (b) Explain Distributed control system (DCS) with neat diagram. 10

6. (a) Explain in detail ON-OFF controller. Describe the importance of dead zone. 10
  (b) Derive Expression for first order High Pass Filter. 10

7. Write short notes on any **three** :— 20
  (a) Fire point calibration procedure
  (b) pH measurement
  (c) Current to voltage converter
  (d) Feed forward controller
  (e) Data Logger.

Con. 11763-14.
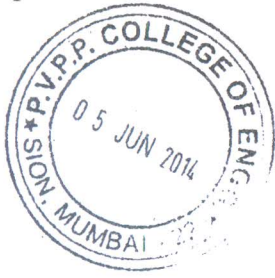
N. B. : (1) Questions **No. 1** is **compulsory**.
　　　　 (2) Solve **any four** questions out of remaining six questions.
　　　　 (3) Figures to the right indicate **full marks**.

1. (a) Diffrentiate between gate characteristics and V-I characteristics of SCR.　　5

　 (b) Justify the use of freewheeling diode in controlled rectitier improves the power 　5
factor.

　 (c) What do you understood by $\frac{di}{dt}$ and $\frac{dv}{dt}$ ratings of SCR. What is the effect 　5
on SCR if they are exceeded.

　 (d) Draw and explain the DC circuit breaker for SCR.　　5

2. (a) What is the difficulty if SCRs connected in series. State and explain different 　10
kinds of eqvalising network with their design criterion.

　 (b) Draw and explain dynamic turn-on and turn-off characteristics of GTO.　　10

3. (a) What do you understand by semiconverter? When it is preferred? Derive the 　10
load voltage expression & draw circuit diagram. Explain its working with
the help of waveforms.

　 (b) Draw and explain Ac full wave control circuit using Diac-Triac with the help 　10
of waveforms. Derive the expression for RMS load voltage.

4. (a) A single phase fully controlled bridge converter supplies an inductive load. 　10
Assuming that the output current is virtually constant and is equal to I_d. Supply

voltage is 230 V and if firing angle is maintained at $\frac{\pi}{6}$.

　　　 (i) Average output voltage.
　　　 (ii) Supply power factor
　　　 (iii) Supply harmonic factor
　　　 (iv) Supply fundamental RMS current.
　　　 (v) votage ripple factor.

　 (b) Expalin the construction and working of IGBT with respect to formation of 　10
inversion layer and transfer characteristics.

[TURN OVER

5. (a) Draw the protection circuit for SCR against $\frac{dv}{dt}, \frac{di}{dt}$ overvoltage and   10 overcurrent with the help of circuit diagram.

    (b) Draw and explain three phase fully controlled bridge converter with R load   10 for contineous and non-continuous conduction mode.

6. (a) Draw equivalent circuit UJT. Draw V-I characteristics of UJT and explain   10 UJT relaxation oscillator.

    (b) What do you understand by commutation of SCR. Explain class D   10 commotation circuit with the help of waveforms.

7. Write short notes on:

    (i) Operating modes of Triac.   7

    (ii) Cooling techniques of power devices   6

    (iii) RC triggering circuit   7

....