

**2018****M.Sc.****2<sup>nd</sup> Semester Examination****PHYSICS****PAPER – PGS-203 (Gr. – A + B)****Full Marks : 50****Time : 2 Hours**

*The figures in the right hand margin indicate full marks.  
Candidates are required to give their answers in their own words as far as practicable.  
Answer Q1 and any one from Q2 and Q3 for each of Groups A & B.*

**(Gr. A – Analog Electronics-II)**

1. Answer any five bits:

5 X 2 = 10

- (i) Define iterative impedance of a network and obtain its expression for a T-network.
- (ii) One high-pass filter & one low-pass filter are given. How can you make a band pass filter by their combination?
- (iii) What is voltage standing wave ratio of a Transmission line? Write its expression.
- (iv) Write the differences between a Transducer and Sensor with one example for each.
- (v) Prove the relation  $\sinh\left(\frac{\gamma}{2}\right) = \sqrt{\frac{Z_1}{4Z_2}}$  for symmetrical T network having series impedance  $Z_1$  and shunt impedance  $Z_2$ ;  $\gamma$  being propagation constant.
- (vi) Explain the use of a triac in controlling ac power delivered to a load.

**(Turn Over)**

(vii) Find the characteristic impedance of the following network:

(viii) Transform the following T network to a  $\pi$  network:

- 2. (a) Obtain the expressions of characteristics impedance and propagation constant of a Transmission line with respect to its line parameters. (5)
- (b) State and explain the two corollaries of Foster’s reactance theorem. (5)
- 3. (a) What types of distortion arise in a transmission line and why? Find the condition of distortionless line. (2+2)
- (b) ) Explain the principle of operation of a silicon controlled rectifier. (4)
- (c) What is phototransistor? Draw its volt-ampere characteristic curves. (2)

**(Gr. B – Digital Electronics-II)**

- 1. Answer any five bits: 5 X 2 = 10
- (i) Explain the difference between static and dynamic memories.
- (ii) A certain memory has capacity 16kX32. How many words does it store?
- (iii) A four bit D/A converter produces an output of 4.5 V for an input code 1001. Find the output for an input code 0011.

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- (iv) What are address bus and data bus in 8085 microprocessor?
- (v) If the voltage swing for a digital signal 1001 of a DAC system is 18V then what is the resolution of the system? What should be the voltage deflection for the input signal 1011?
- (vi) What is Nyquist Rate?
- (vii) Give the circuit of two bit binary multiplier.
- (viii) Give an example of subtraction in signed binary number system.

- 2. (a) Discuss the operation of diode matrix ROM with suitable circuit diagram. (5)
- (b) How erase is performed in EPROM? (3)
- (c) What are the advantages of EEPROM over EPROM? (2)
- 3. (a) Using 16x4 memory IC s design a 16x8 memory. (3)
- (b) What do you mean by write cycle time and data set up time? (3)
- (c) Write an assembly language program for 8085 microprocessor to perform the following task: Store two hexadecimal numbers (97H and 65H) in the register B and C respectively. Then subtract the content of C from that of B and store the result in the memory location E050. (4)

**(Internal Assessment – 10)**