AE-748

M.Sc. (Previous)
Term End Examination, 2016-17

PHYSICS

Paper - IV

Electronics

Time : Three Hours] [*Maximum Marks* : 100
[*Minimum Pass Marks* : 36

Note : Answer any **five** questions. The figures in the right-hand margin indicate marks.

1. (*a*) Explain thermal stabilization and stabilization factor. Discuss parameter for transistor amplifier. 10

(*b*) Obtain and explain the condition of oscillation. Discuss Hartley oscillator. 10

2. Explain the different types of feedback in amplifier. Discuss and differentiate Wien Bridge and phase shift oscillator in brief. 20

3. Explain the construction and working of differential amplifier. Discuss integrator and differentiator. 20

4. Discuss inverting and non-inverting OP-AMP. Explain the use of OP-AMP as function generator. 20

5. Discuss on the following :

(*a*) Half and Full adder and substractor by stable circuits 12

(*b*) RS Flip-flop using NOR and NAND gates 8

6. (*a*) Explain race around condition. Discuss

(*i*) Master-Slave JK Flip-flop;

(*ii*) Shift register. 20

7. Discuss, in brief, construction and working of the following : 20

(*a*) Tunnel diode

(*b*) Gun diode

(*c*) READ diode

8. (*a*) Explain high frequency limitations of transistors. Discuss

(*i*) IMPATT and TRAPATT diode;

(*ii*) Varactor diode. 20

9. (*a*) Explain radiative and non-radiative transitions. Discuss construction and working of

(*i*) Light-emitting diode;

(*ii*) Avalanche photo diode. 20

10. Obtain Einstein relation and threshold condition for laser oscillation. What is laser efficiency ? Explain. 20

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