



NBZ-003-020405 Seat No. _____

M. Sc. (Physics) (Sem. IV) (CBCS) Examination

April / May - 2017

ET - 8 : Pulse & Microwave Electronics

Faculty Code : 003

Subject Code : 020405

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

Instructions :

- (1) All questions are compulsory.
- (2) Number on right margin indicates marks.

1 Attempt any seven : **14**

- (a) Draw sketches to show the shape of the following waveforms: square, triangular, sawtooth, exponential. What is meant by transient waveform?
- (b) Calculate duty cycle of a rectangular waveform of frequency 1 kHz and pulse width 300 microsec.
- (c) Define: RC time constant. Is it possible to charge a capacitor almost fully in one time constant time? How?
- (d) Define rise time of pulse waveform. Is it affected by lower cutoff or upper cutoff frequency of an amplifier?
- (e) Sketch the internal circuit diagram of timer IC-555.
- (f) Distinguish different types of multivibrators.
- (g) Define directional antenna and isotropic antenna with its radiation patterns.
- (h) Define blind speed.
- (i) Why magnetron is known as cross field tube?
- (j) List the solid state microwave devices. Discuss in brief merits and demerits of microwave devices over the microwave tubes.

2 Attempt any **two** :

- (a) Derive expression to relate "rise time" and "fall time" of input pulse waveform to upper cut-off frequency and lower cut-off frequency of an amplifier, respectively. **7**

- (b) Write criteria for getting good differentiation and integration of a periodic waveform. Design integrating circuit for good integration of a square wave of frequency 100 kHz. 7
- (c) Draw the circuits of positive and negative clampers using diodes and explain circuit operation. 7
- 3** (a) Draw the circuit of astable multivibrator using transistors, explain its operation with waveform diagram. 7
- (b) Sketch the circuit of Schmitt trigger using transistors and explain its working and input and output characteristics in detail. Explain when does the circuit exhibit "hysteresis"? 7
- OR**
- 3** (a) Define antenna. What are the different types of antenna? Discuss in brief wire antenna, aperture antenna and array antenna. 7
- (b) Write a full form of RADAR. Discuss construction and working of pulsed radar system. 7
- 4** Attempt any **two** :
- (a) Discuss working principle of travelling wave tube with neat schematic diagram. 7
- (b) Discuss any two display methods. 7
- (c) Discuss with neat diagram fabrication of solid state microwave transistor. 7
- 5** Attempt any **two** : 14
- (a) Discuss with circuit diagrams: RC Ramp waveform generator
- (b) Discuss in brief: Diode Clippers and applications
- (c) Reflex klystron
- (d) Yagi-Uda antenna.