

[17/A-7]

SEAT No. \_\_\_\_\_

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# SARDAR PATEL UNIVERSITY

S.Y.B.Sc. (Sem. - IV) Examination

15<sup>th</sup> APRIL 2019, Monday

Subject Code: US04EELE02

Subject: Instrumentation

Time: 10:00 am TO 12:00 pm

Marks: 70

Q-1

Multiple Choice Questions.

(10)

1. Which of the following is the wrong expression?  
a)  $i_1 v_1 = i_2 v_2$   
b)  $i_1 N_1 = i_2 N_2$   
c)  $i_1 N_2 = i_2 N_1$   
d)  $v_2 N_1 = v_1 N_2$
2. Which of the following does not change in an ordinary transformer \_\_\_\_\_?  
a) current  
b) Frequency  
c) voltage  
d) all of above
3. In a transformer the resistance between its primary and secondary is \_\_\_\_\_.  
a) infinite  
b) cannot be predicted  
c) very small  
d) none.
4. A relay is \_\_\_\_\_ switch.  
a) electromechanical  
b) electronic  
c) mechanical  
d) none
5. The abbreviation SSR stands for \_\_\_\_\_.  
a) solid system relay  
b) solid state relay  
c) simple solid relay  
d) solid standard relay
6. In 4 pin relay, normally closed condition occurs when pin \_\_\_\_\_ are open.  
a) pin 2 & 3  
b) pin 1 & 3  
c) pin 2 & 4  
d) pin 1 & 2
7. Self generating type transducer is called as \_\_\_\_\_ transducer.  
a) active  
b) secondary  
c) passive  
d) inverse
8. One of the following can acts as a inverse transducer : \_\_\_\_\_  
a) inductive transducer  
b) piezoelectric crystal  
c) capacitive transducer  
d) L.V.D.T
9. For which type of measurement, a piezoelectric transducer is suitable?  
a) high temperature  
b) static pressure  
c) Dynamic pressure  
d) low temperature
10. Device which converts an input device state into a binary representation of ones or zeros is termed as \_\_\_\_\_.  
a) decoder  
b) multiplexer  
c) data selector  
d) encoder

(1)

(P.T.O.)

- Q-2 Answer in short. (Any Ten) (20)**
1. What is voltage transformation ratio?
  2. Explain ideal transformer on load.
  3. Give the comparisons between core and shell type transformer.
  4. Draw the timing diagram for On delay timer of relay.
  5. What is the difference between the relay and contractors?
  6. Draw the circuit diagram of Photo-Coupled SSR.
  7. Draw the block diagram of transducer.
  8. Explain active transducer and passive transducer.
  9. Explain primary transducer and secondary transducer.
  10. Explain encoder and decoder.
  11. Draw the diagram of capacitive transducer.
  12. Classify the standards in transducer.

- Q-3 (A) Explain in detail construction and working of a transformer. (06)**
- (B) A 25 KVA, single-phase transformer has 250 turns on primary and 40 turns on secondary winding. The primary is connected to 1500-volts, 50 Hz mains. Calculate (i) primary and secondary currents on the full-load (ii) Secondary e.m.f and (iii) Maximum flux in the core (04)**

**OR**

- Q-3 (A) Derive the e.m.f equation of a transformer. (06)**
- (B) The maximum flux density in the core of a 250/3000 volts, 50 Hz single-phase transformer is  $1.2 \text{ Wb/m}^2$ . If the e.m.f. per turn is 8 volts, Determine (i) Primary and secondary turn (ii) Area of the core. (04)**

- Q-4 (A) With necessary circuit diagram explain the working and construction of relays. (05)**
- (B) Explain in detail relay logic. (05)**

**OR**

- Q-4 (A) Write a short note on: Reed –Relay –Coupled SSR (05)**
- (B) Write a short note on: Transformer Coupled SSR. (05)**

- Q-5 Explain dynamic characteristic of transducer. (10)**

**OR**

- Q-5 Explain static characteristic of transducer. (10)**

- Q-6 Explain potentiometric type transducer with diagram. Give its advantages and disadvantages. (10)**

**OR**

- Q-6 Explain the construction and working of LVDT with labelled diagram. Also give its advantages, disadvantages and uses of LVDT. (10)**