

Reg. No .....

Name .....

**MSc DEGREE END SEMESTER EXAMINATION - MARCH 2020****SEMESTER 4 : PHYSICS****COURSE : 16P4PHYT16EL : INSTRUMENTATION AND COMMUNICATION ELECTRONICS***(For Regular - 2018 Admission and Supplementary 2017, 2016 Admissions)*

Time : Three Hours

Max. Marks: 75

**Section A****Answer All the Following (1 mark each)**

1. Which transducer is known as 'self-generating transducer'?  
a) Active transducer    b) Passive transducer    c) Secondary transducer    d) Analog transducer
2. Which of the following represents piezoelectric materials?  
a) ADP    b) Quartz    c) Bernilite    d) All of the mentioned
3. In a DVM, a signal conditioning circuit is used .....  
a) to bring current to a suitable limit    b) to bring resistance to a suitable limit  
c) to bring resistance to s suitable limit    d) to bring voltage to a suitable limit
4. Main disadvantage of a true r.m.s responding voltmeter is .....  
a) presence of transducer    b) presence of thermocouple  
c) presence of transformer    d) presence of oscillator
5. A 500 W carrier is amplitude modulated with modulation index of 60%. What will be total power of modulated wave?  
a)640.5 W    b)590 W    c)780 W    d)450 W

(1 x 5 = 5)

**Section B****Answer any 7 (2 marks each)**

6. Distinguish between X-Y and strip chart recorders.
7. Define transducers
8. List five physical quantities that transducers measures.
9. Distinguish between Active and passive Transducers
10. What is "Stylus" in CRO ?.
11. What are the advantages of DVM over analog voltmeter?
12. What is delay line? Where it is used and why it is used in a CRO?
13. Brief the need for modulation.
14. What are transmission lines? What is the need for them?
15. Explain Maximum usable frequency and skip distance in ionosphere propagation

(2 x 7 = 14)

**Section C****Answer any 4 (5 marks each)**

16. Write short note on DSO
17. A resistance strain gauge with a gauge factor of 2 is cemented to a steel member is subjected to a strain of  $1 \times 10^{-6}$ . If the original resistance value of the gauge is 130, calculate the change in resistance.
18. Give the basic principle of a differential voltmeter. How it can be used for AC measurement?
19. Describe a true RMS voltmeter with a neat diagram
20. Describe a balanced modulator circuit and explain its function.
21. A 400 W carrier is modulated on a depth of 75%. Calculate total power in the modulated wave in the following forms of AM: (i) Double side and suppressed carrier; (ii) SSB.

(5 x 4 = 20)

**Section D****Answer any 3 (12 marks each)**

- 22.1. Give the block diagram of a digital storage oscilloscope. Explain its working.  
**OR**
2. Explain the principle and operation of pressure transducer employing resistive Transducer and inductive transducer
- 23.1. Draw the circuits of an AC voltmeter using rectifier and explain its operation  
**OR**
2. Explain the following a) output power meter b) vector impedance meter.
- 24.1. Discuss in detail transmission line characteristic impedance, its calculation and losses in transmission lines.  
**OR**
2. Draw the circuit diagram of a single side band amplitude modulation circuit and explain its working. What are the advantages with SSB transmission?

(12 x 3 = 36)