P427   Name:…………………………………………………

                                                                Reg. No…………………………………………..

MSc DEGREE END SEMESTER EXAMINATION MARCH 2016

SEMESTER – **4, PHYSICS**

COURSE: P4PHYT15EL, INSTRUMENTATION AND COMMUNICATION ELECTRONICS

Time: Three Hours   Max. Marks: 75

Part A

(Objective Type, Answer **all** questions, each questions carries 1 mark)

1. A digital frequency meter uses an
    (a) OR gate   (b) AND gate   (c) NOT gate   (d) Exclusive OR gate
2. The sensitivity of a volt meter is defined as
    (a) Ω / V (b) V / Ω (c) I / Ω (d) Ω / I
3. A strip chart recorder uses special photo sensitive chart paper sensitive to_____ light for optical writing.
4. The data transmission rate of a modem is measured in
    a) Bytes per second   b) baud rate   c) bits per second   d) mega hertz
5. GPS consist of a network of ----- satellites orbiting the earth.
    (a) 24   (b) 12   (c) 18   (d) 9

                                                                                (1 x 5 = 5)

Part B

(Answer **any five** question, each question carries 2 marks)

6. How a differential output transducer works? What are its advantages?
7. Explain the operating principle of a ramp type digital voltmeter.
8. Why a transistor voltmeter cannot be used   for measurement in the microvolt range?
9. What are the basic components of a magnetic recorder?
10. Briefly describe standing waves.
11. Discuss the types of losses that may occur with RF transmission lines.
12. Differentiate between Klystron and Magnetron.
13. What is a data set? Where is it used in a data transmission system?   (2 x 5 = 10)

Part C

(Answer any 3 questions, each question carries 4 marks)

14. Explain with a diagram the working of a digital tachometer.
15. Derive the relation between the gauge factor and poisson's ratio for a resistance strain gauge.
16. The chart speed of a recording instrument is 40mm/s. One cycle of the signal is recorded over 5mm. Determine the frequency of the signal.
17. Explain vestigial side band transmission.
18. Explain the principle of pulse code modulation.   (4 x 3 = 12)

                                                                                (PTO)

Part D

(Answer **all** question, 12 marks each)

19. What are Photoelectric Transducers? Explain the different types of Photoelectric Transducers.

OR

Explain the operation of a digital multi meter. State the advantages of digital instruments over analog instruments.

20. Explain with block diagram the principle and working of a.c. voltmeter using rectifiers.

OR

Describe the operation of a X-Y recorder. Also differentiate between plotter and recorder.

21. What is single side band suppressed carrier modulation? What are its advantages with respect to ordinary amplitude modulation? Explain the phase cancellation method of SSB generation. What change is necessary to suppress the other side band?

OR

Describe briefly the strata of the ionosphere and their effects on sky wave propagation. Why this propagation generally better at night than during the day?

22. Explain basic principle of Code Division Multiplexing and Time Division Multiplexing. Enumerate the advantages of TDM over FDM.

OR

Explain the principle of pulse width modulation. With the help of a circuit explain the generation of PWM. How is demodulation done in PWM?

$(12 \times 4 = 48)$

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