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PBM-003-0491006 Seat No. _____

B. Sc./ M. Sc. (Sem. I/III) (CBCS) Examination

November / December - 2018

IV : Applied Physics - II

(New Course)

Faculty Code : 003

Subject Code : 0491006

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 Attempt any **seven** short questions : (two marks each) **14**

(1) State the principal of superposition of sound wave.

(2) Define transverse wave and longitudinal wave.

(3) What is an organ pope ? How does it produce sound ?

(4) Define reverberation and write Sabine's formula for reverberation.

(5) Give the full form of SONAR and write any two applications of SONAR.

(6) What is magnetostriction effect ? Explain with necessary figures.

(7) Classify the substances according to their resistivity.

(8) Explain electric potential and potential difference.

(9) Define electromotive force (emf) of a source.

(10) Write a unit of magnetic flux and indicate relationship of different units.

2 (a) Write answers of any **two** : **10**

(1) Discuss Newton's formula and Laplace correction for velocity of sound in gases.,

(2) Explain the formation of stationary wave in open organ pipe.

(3) Write laws of transverse vibrations of a string.

(4) Describe and explain : Melde's experiment.

(b) Write answers of any **one** : 4

(1) Define interference and stationary waves in detail.

(2) What are the various factors affecting the velocity of sound in a gas ?

3 (a) Write answers of any **two** : **10**

(1) Write the conditions of good acoustics.

(2) Discuss factors which affect acoustics of buildings and write their remedies.

(3) Discuss construction and working principle of piezoelectric generator.

(4) What is acoustic grating ? Explain the acoustic grating method to determine the velocity of ultrasonic wave.

(b) Write answers of any **two** : 4

(1) Write the difference between loudness and intensity.

(2) Define reverberation and write Sabine's formula for reverberation.

(3) Write the industrial applications of ultrasonic wave in detail.

(4) Compare Destructive Testing and Non Destructive Testing.

4 (a) Write answers of any **two** : **10**

(1) Discuss the current density, conductance and conductivity.

(2) Derive the equation for electric field due to a charged surface.

(3) Define temperature coefficient of resistivity. Discuss the effect of temperature on the resistivity of metal, semiconductor and insulator.

(4) What is capacitor ? Derive the formula for parallel plate capacitor.

(b) Write answers of any **one** : **4**

(1) Explain Kirchhoff's law for capacitors by the use of Whetstone Bridge.

(2) Explain working principle of voltmeter and Ammeter.

5 (a) Write answers of any **two** : **10**

(1) Explain electromagnetic induction in detail. Describe magnetic flux with necessary figures.

(2) Define self inductance with its write units and dimensions. Explain two phenomena associated with self inductance.

(3) State and explain Lenz's law with energy conservation.

(4) Describe motional emf in detail.

(b) Write answers of any **one** : **4**

(1) (a) State Faraday's law of electromagnetic induction. Write this law mathematically.

(b) What do you mean by Eddy current ?

(2) Write a brief note on mutual induction.