

NORTHWEST ACCREDITATION COMMISSION, USA

HIGH SCHOOL DIPLOMA (Sr. Secondary/12TH) 2014-2015

Subject- PHYSICS (Practical), Subject Code – PP403

Question Paper No. :

P	H	2	2
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Date:

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Question Paper Code:

P	P	6	6
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Roll No.:

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Time: 1.30 Hours.

Total Marks: 30

IMPORTANT INSTRUCTIONS

1. OPENING AND CHECKING OF THE QUESTION-BOOKLET

Break open the seal of the Question-Booklet only when the announcement is made by the Invigilator. After breaking the seal and before attempting the questions, student should immediately check for:

- a) The number of the printed page in the Question-Booklet is the same as mentioned on the cover page of the Booklet and
- b) Any printing error in the Booklet pages, if any.

Any discrepancy or error should be brought to the notice of the Invigilator who will then replace the Booklet. No additional time will be given for this.

2. No student, without the permission of the Superintendent, or the Invigilator concerned, is to leave his/ her seat or the Examination Room.

3. FILLING UP THE REQUIRED INFORMATION ON QUESTION-BOOKLET AND ANSWER SHEET

After breaking open the seal and checking the Booklet, student should:

- a) Fill up the **Question Paper No.** and **Question Paper Code** (mentioned on the cover of Question-Booklet) in the space provided on the First Answer Sheet.
- b) Fill up his/her Roll Number on the First Answer Sheet and on each Supplementary Answer Sheet, if taken.
- c) Student should mention the total number of **Supplementary Answer Sheet**, if taken, in the space provided on the First Answer Sheet and also fill up the Serial Number mentioned on each **Supplementary Answer Sheet** along with his/her Roll Number in the register maintained by the Invigilator. Student must tie all the Answer Sheets with the thread provided by the Invigilator.

4. INSTRUCTIONS ABOUT QUESTION PAPER

- a) This Question Paper includes five questions. All questions are compulsory.
- b) All questions are carrying six marks each.

5. Student found in possession of Cellular Phone / Mobile Phone / Pager or any other Communication Device and/or any Book/Note whether using or not, will be liable to be debarred for taking examination(s) either permanently or for specified period or/and dealt with as per law or/and ordinance of the School/SERI according to the nature of offence, or/and he/she may be proceeded against and shall be liable for prosecution under the relevant provision of the Statutory Law.

THE ANSWER SHEET IS TO BE RETURNED ON COMPLETION OF THE TEST

Question 1. Derive the formula for the equivalent emf and internal resistance of the parallel combination of the cells of emf E_1 and E_2 and internal resistance r_1 and r_2 respectively. Two cells of emf 1V and 2V and internal resistance 2Ω and 1Ω respectively connected in (i) series (ii) parallel. What should be the value of external resistance in the circuit so that the current through the resistance be the same in the two cases? In which case more heat is generated in the cells?

OR

Derive an expression for impedance of a series LCR circuit connected to an ac source. When does its value become minimum.

Sketch graph (i) X_L Vs ω (ii) X_C Vs ω (iii) Z Vs ω .

Question 2. Derive the relationship between the peak and rms value of current in an AC circuit. For circuits used for transmission of electric power a low power factor implies large power loss in the transmission explain.

OR

Define the terms 'depletion layer' and 'barrier potential' for a P-N junction diode. How does an increase in the doping concentration affect the width of the depletion region?

Draw the circuit of a full wave rectifier. Explain its working.

Question 3. Draw a labeled diagram to explain the principle and working of an A.C. generator. Deduce the expression for emf generated. Why the current produced by an A.C. generator cannot be measured with a moving coil ammeter?

OR

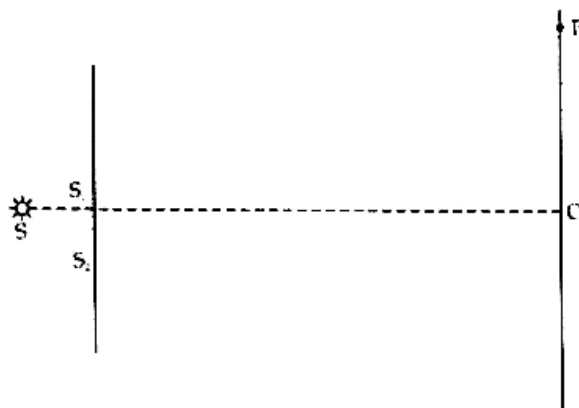
(a) Show diagrammatically two different arrangements used for winding the primary and secondary coils in a transformer.

(b) Assuming the transformer to be an ideal one, write the expressions for the ratio of its output voltage to input voltage.

(c) The core of transformer is made of magnetic material. Give any two properties of such materials used.

(d) Write any four types of energy losses in transformer.

Question 4.



The figure, drawn here, shows a modified Young's double slit experimental set up.

If $SS_2 - SS_1 = \lambda/4$,

- (i) State the condition for constructive and destructive interference
- (ii) obtain an expression for the fringe width.
- (iii) locate the position of the central fringe.

OR

- (a) Name the radiations used:
- (i) to kill germs in impure water
 - (ii) in the study of crystal structure
 - (iii) in T.V. communication

Which of these radiations has highest frequency?

- (b) An electric dipole of moment \mathbf{p} is placed in a uniform electric field \mathbf{E} . Derive the expression for the potential energy of the dipole and show diagrammatically the orientation of the dipole in the field for which the potential energy is (i) maximum (ii) minimum.

- Question 5.** (A) Using the relation for the refraction at a single spherical refracting surface, derive lens maker's formula for a thin convex lens.
- (B) The radius of curvature of either face of a convex lens is equal to its focal length. What is the refractive index of its material?

OR

Define diffraction. Deduce an expression for fringe width of the central maxima of the diffraction pattern, produced by single slit illuminated with monochromatic light source.

Sample Paper