Roll No. | | | | | | |

Answer Shee_____ 99

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Sig. of Invigilator._____

RADIOGRAPHIC TECHNIQUES HSSC–I

SECTION – A (Marks 20)

Time allowed: 25 Minutes

NOTE: Section–A is compulsory and comprises pages 1-2. All parts of this section are to be answered on th question paper itself. It should be completed in the first 25 minutes and handed over to the Centre Superintendent. Deleting/overwriting is not allowed. Do not use lead pencil.

Q. 1 Circle the correct option i.e. A / B / C / D. Each part carries one mark.

(i) Which part corresponds to the conversion of A.C into D.C?

A. Ionization B. Amplication

C. Rectification D. Transition

(ii) Which of the following is called Anode in P.N.Junction?

A. n region B. P region

C. P-n region D. n-P region

(iii) Which of the following is used in A.C circuit to limit the current with extremely small voltage of energy?

A. Resistance B. Rheostate

C. Choke D. Inductance

(iv) Who discovered X-ray?

A. Lane B. Tungston

C. Roentgen D. Geiger

(v) Which of the following is used as contrast medium chemical to make the digestive tract visible?

A. Calcium sulphate B. Barium sulphate

C. Barium sulphide D. Barium nitrate

(vi) Which of the following corresponds to the combined effect of resistance and resistances in A.C circuit?

A. Choke B. Capacitor

C. Modulation D. Impedance

(vii) On which of the following principles does a transformer work?

A. Self Induction B. Fleming's right hand rule

C. Emotional e.m.f D. Mutual induction

(viii) What are the two main causes of power loss in transformer?

A. Eddy current and voltage B. Voltage and current

C. Eddy current and magnetic hysteresis D. Magnetic hysteresis and primary winding

(ix) Which of the following is an example of non-ohmic devices?

A. Resistance B. Bulb

C. Fan D. Semi-conductor diode

(x) Which of the following refers to resistor-capacitor combination when 1 ohm x 1 farad?

A. 1 volt B. 1 capacitance

C. 1 second D. 1 coulomb

(xi) Which of the following statements is **TRUE**?

A. β-particle moves faster than α-particle

B. β-particle moves with equal velocity of α-particle

C. α-particle moves faster than β-particle

D. β-particle moves faster than γ-particle

.....

(xii) Which of the following statements is **TRUE**?

A. Gamma radiations have longer wave-length than the wave length of X-rays

B. X-rays have shorter wave-length and greater energy than Gamma radiation

C. X-rays are non-penetrating than Gamma radiation

D. Gamma radiations have shorter wave-length and energy than X-rays radiation

(xiii) Which of the following is equal to coulomb per volt?

A. Ohm B. Impedance

C. Henry D. Farad

(xiv) Which is the unit of electric intensity?

A. Coulomb / Newton B. Meter / Volt

C. Newton / Metre D. Volt / Metre

(xv) Which of the following statements is **CORRECT**?

A. Straight X-rays involve the use of a contrast medium

B. Special X-rays do not involve the use of a contrast medium

C. Special X-rays are useful for examining the bonny structure

D. Straight X-rays do not involve the use of a contrast medium

(xvi) What gives the orbit a positive charge?

A. By loosing neutron B. By gaining electron

C. By loosing electron D. By gaining proton

(xvii) Which of the following particles is responsible for giving positive charge to the nucleus of an atom?

A. Electron B. Neutron

C. Proton D. None of these

(xviii) In which of the following circuits does the current remain the same in all the resistances?

A. Parallel circuit B. Series circuit

C. Short circuit D. Open circuit

(xix) Which of the following statements is **TRUE**?

A. The product of power and time is intensity.

B. The ratio of power and work done is the reciprocal of time.

C. The ratio of time and work done is power.

D. The ratio of power and time is work done.

(xx) Which of the following corresponds to the rate of doing work?

A. Joule / sec B. Joule / watt

C. Watt / second D. None of these

For Examiner's use only:

Total Marks: 20

Marks Obtained:

/100

RADIOGRAPHIC TECHNIQUES HSSC–I

Time allowed: 2:35 Hours **Total Marks Sections B and C: 80**

NOTE: Answer any ten parts from Section 'B' and any three questions from Section 'C' on the separately provided answer book. Use supplementary answer sheet i.e. Sheet–B if required. Write your answers neatly and legibly.

SECTION – B (Marks 50)

Q. 2 Answer any TEN parts. The answer to each part should not exceed 2 to 4 lines. **(10 x 5 = 50)**

(i) Briefly write the basic structure of an atom.

(ii) State three properties of resistances connected in series.

(iii) Define Emotional emf.

(iv) Define Faraday's Law of electromagnetic induction.

(v) What is Mutual and Self induction?

(vi) Define A.C (Alternating current) generator.

(vii) Write the mathematical experession of specific resistance.

(viii) Define Ohm's law with one limitation.

(ix) Define **Potential difference**.

(x) Write the mathematical expression of equivalent resistance Re, when the resistances are connected is series?

(xi) Write three properties of resistances connected in parallel.

(xii) Define Electric power and write its mathematical expression.

(xiii) Write three hazards of electricity.

(xiv) Define e.m.f.

(xv) Write two radiation hazards in hospital.

SECTION – C (Marks 30)

Note: Attempt any THREE questions. All questions carry equal marks. **(3 x 10 = 30)**

Q. 3 How are X-rays produced? Also draw its diagram.

Q. 4 Describe the different types of radiations, their nature and characteristics.

Q. 5 How are radiations detected? Explain.

Q. 6 Write all possible precautions to be taken, while taking X-ray of a patient.

Q. 7 Derive the expression $\frac{1}{\text{Re}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ when three resistances $R_1, R_2 \& R_3$ are connected in parallel.