RADIOGRAPHIC TECHNIQUES HSSC–I

SECTION – A (Marks 20)

Time allowed: 25 Minutes | **Version Number** | 1 | 8 | 5 | 5 |

Note: **Section – A is compulsory. All parts of this section are to be answered on the separately provided OMR Answer Sheet which 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 **Choose the correct answer A / B / C / D by filling the relevant bubble for each question on the OMR Answer Sheet according to the instructions given there. Each part carries one mark.**

1) What is the unit of current?

A. Ampere B. Volt

C. Watt D. None of these

2) What is Electrical Resistance?

A. Property to oppose the flow of current

B. Property to allow the flow of current

C. Property to affect the flow of heat

D. None of these

3) What is Watt?

A. Unit of energy B. Unit of potential differential

C. Unit of current D. Unit of power

4) "Wherever current flows through a wire, a magnetic field is set up around it", this is:

A. Motor effect of current B. Generator effect of magnet

C. Heating effect of current D. Magnetic effect of current

5) Which of the following is true for a circuit having resistances in series?

A. Its total resistance can be found by simple arithmetic addition of resistances

B. Different current flows through all the resistances

C. Voltage is same across each resistance

D. None of these

6) Which of the following laws is working principle of an electric motor?

A. Ohm's law

B. Electrodynamics law

C. Faraday's law of electromagnetic induction

D. Law of Resistance

7) Which of the following equation is derived in Coulomb's law?

A. $H = I^2Rt$ B. $F = KQ_1 \times Q_2 / r^2$ C. $V = I \times R$ D. $R = R_1 + R_2 + R_3 ..... + R_n$

8) Which of the followings describes the Parallel Circuit of resistances?

A. Sum of all the resistances is lower than any one resistance in the circuit.

B. Current is same in each resistance

C. Voltage remains different across all the resistance

D. None of these

9) Which of the following is also used as test circuit?

A. Short circuit B. Series circuit C. Parallel circuit D. Series – Parallel circuit

10) Which of the following factors is used to increase the induced e.m.f in the conductors in an electric generator?

A. Speed of movement of conductor in magnetic field

B. Number of coils outside the magnetic field

C. Increasing the size of generator

D. None of these

11) Which of the following is true for Impedance?

A. Transformer may be used to increase or decrease the voltage

B. Only Inductance and Capacitance are used

C. Combined effect of Resistance, Inductance and Capacitance is called Impedance

D. None of these

12) Which of the following values of AC is used as equivalent to DC?

A. Peak Value B. Average Value

C. RMS value D. None of these

13) Which of the following devices works on principle of thermionic emission?

A. Capacitor B. Transformer

C. Diode D. Electric Motor

14) What is called, "Whenever a conductor cuts a magnetic field, an emf is induced in it"?

A. Electric effect of a magnet B. Magnetic effect of electric current

C. Generator effect D. Motor effect

15) Which of following is defined as, "a phenomenon in which a changing current in one coil induces an emf in another coil"?

A. Magnetic Induction B. Mutual Induction

C. Electric Induction D. None of these

16) Which of the following values of AC is commonly used to express voltage in X-Ray machine?

A. R.M.S value B. Peak value

C. Average value D. None of these

17) Which of the following conditions is called resonance?

A. When X_L is lower than X_C B. When X_L is higher than X_C

C. When X_L is equal to X_C D. None of these

18) Which of the following waves require a medium for transmission?

A. Sound waves B. Gamma waves

C. Electromagnetic waves D. Light waves

19) Which of the following ionizes the matter through which it passes?

A. Radio waves B. Microwaves

C. Light Rays D. X-Rays

20) Which of the following is done by X-Ray machine as transducer?

A. It coverts electrical energy into Mechanical Energy

B. It coverts Mechanical energy into Electrical Energy

C. It coverts electrical energy into Electromagnetic Radiation Energy

D. None of these.

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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) Define and differentiate between Resistance and Impedance.

(ii) Define Law of Magnetic force.

(iii) Define Energy and Power. Also write their units.

(iv) What is Faraday's Law of electromagnetic induction?

(v) Write working principle of electric motor.

(vi) Discuss properties of Resistances in a Parallel Circuit.

(vii) Differentiate between A.C and D.C.

(viii) Define frequency, wavelength and Time Period.

(ix) What is the difference between Mutual and Self Induction?

(x) Explain working principle of a Transformer.

(xi) How does a diode work?

(xii) Differentiate Ionization and Excitation.

(xiii) Enumerate types of Ionizing and Non-ionizing radiations.

(xiv) Define 'inductance' and 'capacitance'?

(xv) Enlist four steps used for film processing in Radiography.

SECTION – C (Marks 30)

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

Q. 3 Define Laws of Resistance and derive a relation for them.

Q. 4 **a.** Explain Ohm's Law

b. Three resistances of 9, 11 and 13 ohms are connected in parallel and supplied with 100 volts. Find total resistance and current for each resistance.

Q. 5 What is a film? What types of films are used in radiography for different parts of body?

Q. 6 Explain the manual and automatic processing of films.

Q. 7 Write a detail note on Transformers.