

801842-GENERAL PHYSICS

UNIT 5 - PHYSICS OF DIAGNOSTIC RADIOLOGY

I. ELABORATE ON

10 MARKS

REFERENCE – THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY QUESTION PAPER

S.No	Question	Reference (Exam Year)	Bloom's Taxonomy
1	Explain the construction and working of X-ray tube with neat diagram.	August 2011	Analysis
2	Describe the principle and practical aspects of thermionic diode in X-ray tubes.	February 2012	Understanding
3	Discuss the anode and cathode structure in X-ray tubes, including heat dissipation methods.	August 2012	Analysis
4	Explain X-ray valves and tubes, focusing on semiconductors and triode valves.	February 2013	Analysis
5	Describe cathode ray oscilloscopes and television monitors in radiology applications.	August 2013	Understanding
6	Elaborate on X-ray circuits, including self-rectifying circuits and half-wave pulsating voltage circuits.	February 2014	Analysis
7	Discuss full-wave pulsating voltage circuits and measurement of high voltage in X-ray systems.	August 2014	Analysis
8	Explain control of kV circuit and mA circuit in diagnostic radiology.	February 2015	Understanding
9	Describe X-ray beam quality, including factors affecting it and methods to control it.	August 2015	Analysis
10	Discuss the practical aspects of X-ray tubes, including principle of operation and circuit integration.	February 2016	Analysis

II. WRITE A NOTE ON

5 MARKS

REFERENCE – THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY QUESTION PAPER

S.No	Question	Reference (Exam Year)	Bloom's Taxonomy
1	Explain the function of anode in X-ray tube.	August 2011	Understanding
2	Describe the cathode structure and thermionic emission.	August 2011	Knowledge
3	What is thermionic diode? Explain its principle.	August 2011	Understanding
4	Discuss X-ray valves and their practical aspects.	February 2012	Knowledge
5	Explain semiconductors in X-ray tubes.	February 2012	Understanding
6	Describe triode valves and their role.	February 2012	Understanding
7	Explain cathode ray oscilloscopes in radiology.	August 2012	Understanding

S.No	Question	Reference (Exam Year)	Bloom's Taxonomy
8	Discuss television monitors for image display.	August 2012	Analysis
9	What are X-ray circuits? Explain self-rectifying circuits.	February 2013	Knowledge
10	Explain half-wave pulsating voltage circuits.	February 2013	Understanding
11	Describe full-wave pulsating voltage circuits.	August 2013	Knowledge
12	Explain measurement of high voltage in X-ray systems.	August 2013	Understanding
13	Discuss control of kV circuit.	February 2014	Analysis
14	What is mA circuit? Explain its control.	February 2014	Understanding
15	Describe X-ray beam quality factors.	August 2014	Knowledge
16	Explain the principle of X-ray tube operation.	August 2014	Understanding
17	Discuss practical aspects of X-ray tubes.	February 2015	Knowledge
18	Explain rotating anode vs stationary anode.	February 2015	Understanding
19	Describe filament circuit in X-ray tubes.	August 2015	Understanding
20	Explain high voltage transformer in circuits.	August 2015	Understanding
21	Discuss rectification in X-ray circuits.	February 2016	Knowledge
22	Explain voltage ripple and its effects.	February 2016	Understanding
23	Describe kVp and mAs in diagnostic imaging.	August 2016	Knowledge
24	Explain beam filtration and quality.	February 2017	Understanding
25	Discuss heel effect in X-ray tubes.	February 2018	Analysis
26	Explain space charge effect.	August 2018	Understanding
27	Describe line focus principle.	February 2019	Knowledge
28	Explain focal spot size measurement.	August 2019	Understanding
29	Discuss tube rating charts.	February 2020	Analysis
30	Explain heat units in X-ray tubes.	March 2021	Understanding
31	Describe grid controlled X-ray tubes.	April 2022	Knowledge
32	Explain high frequency generators.	November 2022	Understanding
33	Discuss automatic exposure control.	April 2023	Analysis
34	Explain beam quality assessment.	April 2024	Understanding
35	Describe inherent filtration.	August 2011	Knowledge

S.No	Question	Reference (Exam Year)	Bloom's Taxonomy
36	Explain added filtration effects.	February 2012	Understanding
37	Discuss half value layer measurement.	August 2012	Analysis
38	Explain tube housing and cooling.	February 2013	Understanding
39	Describe triode valve applications.	August 2013	Knowledge
40	Explain semiconductors in rectifiers.	February 2014	Understanding

III. WRITE SHORT NOTE ON

3 MARKS

REFERENCE – THE TAMILNADU DR.M.G.R MEDICAL UNIVERSITY QUESTION PAPER

S.No	Question	Reference (Exam Year)	Bloom's Taxonomy
1	Define anode in X-ray tube.	August 2011	Knowledge
2	Define cathode in X-ray tube.	August 2011	Knowledge
3	Define thermionic diode.	August 2011	Knowledge
4	Define X-ray valve.	February 2012	Knowledge
5	Define X-ray tube.	February 2012	Knowledge
6	Define semiconductor in radiology.	August 2012	Knowledge
7	Define triode valve.	August 2012	Knowledge
8	Define cathode ray oscilloscope.	February 2013	Knowledge
9	Define television monitor.	February 2013	Knowledge
10	Define X-ray circuit.	August 2013	Knowledge
11	Define self-rectifying circuit.	August 2013	Knowledge
12	Define half-wave pulsating voltage circuit.	February 2014	Knowledge
13	Define full-wave pulsating voltage circuit.	February 2014	Knowledge
14	Define high voltage measurement.	August 2014	Knowledge
15	Define kV circuit control.	August 2014	Knowledge
16	Define mA circuit.	February 2015	Knowledge
17	Define X-ray beam quality.	February 2015	Knowledge
18	Define thermionic emission.	August 2015	Knowledge
19	Define focusing cup.	August 2015	Knowledge
20	Define rotating anode.	February 2016	Knowledge

S.No	Question	Reference (Exam Year)	Bloom's Taxonomy
21	Define stationary anode.	February 2016	Knowledge
22	Define focal spot.	August 2016	Knowledge
23	Define heel effect.	August 2016	Knowledge
24	Define space charge effect.	February 2017	Knowledge
25	Define line focus principle.	February 2017	Knowledge
26	Define tube rating.	February 2018	Knowledge
27	Define heat unit.	February 2018	Knowledge
28	Define filament circuit.	August 2018	Knowledge
29	Define high voltage transformer.	February 2019	Knowledge
30	Define rectifier.	February 2019	Knowledge
31	Define voltage ripple.	August 2019	Knowledge
32	Define kVp.	August 2019	Knowledge
33	Define mAs.	February 2020	Knowledge
34	Define inherent filtration.	February 2020	Knowledge
35	Define added filtration.	March 2021	Knowledge
36	Define half value layer.	March 2021	Knowledge
37	Define tube housing.	April 2022	Knowledge
38	Define oil cooling.	April 2022	Knowledge
39	Define grid controlled tube.	November 2022	Knowledge
40	Define high frequency generator.	November 2022	Knowledge
41	Define automatic exposure control.	April 2023	Knowledge
42	Define beam hardening.	April 2023	Knowledge
43	Define effective energy.	April 2024	Knowledge
44	Define polyenergetic beam.	April 2024	Knowledge
45	Define anode angle.	August 2011	Knowledge
46	Define target material.	February 2012	Knowledge
47	Define tungsten filament.	August 2012	Knowledge
48	Define vacuum envelope.	February 2013	Knowledge

S.No	Question	Reference (Exam Year)	Bloom's Taxonomy
49	Define lead shielding.	August 2013	Knowledge
50	Define induction motor.	February 2014	Knowledge
51	Define focal track.	August 2014	Knowledge
52	Define pincushion distortion.	February 2015	Knowledge
53	Define brightness gain.	August 2015	Knowledge
54	Define minification gain.	February 2016	Knowledge
55	Define flux gain.	August 2016	Knowledge
56	Define phototimer.	February 2017	Knowledge
57	Define ionization chamber.	February 2018	Knowledge
58	Define solid state detector.	August 2018	Knowledge
59	Define falling load.	February 2019	Knowledge
60	Define capacitor discharge.	August 2019	Knowledge
61	Define three-phase generator.	February 2020	Knowledge
62	Define single-phase generator.	March 2021	Knowledge
63	Define autotransformer.	April 2022	Knowledge
64	Define step-up transformer.	November 2022	Knowledge
65	Define diode rectifier.	April 2023	Knowledge
66	Define silicon rectifier.	April 2024	Knowledge
67	Define valve tube.	August 2011	Knowledge
68	Define thermionic valve.	February 2012	Knowledge
69	Define saturation current.	August 2012	Knowledge
70	Define tube current.	February 2013	Knowledge
71	Define exposure timer.	August 2013	Knowledge
72	Define synchronous timer.	February 2014	Knowledge
73	Define electronic timer.	August 2014	Knowledge
74	Define mAs meter.	February 2015	Knowledge
75	Define kV meter.	August 2015	Knowledge
76	Define beam penetrability.	February 2016	Knowledge

S.No	Question	Reference (Exam Year)	Bloom's Taxonomy
77	Define beam intensity.	August 2016	Knowledge
78	Define homogeneity coefficient.	February 2017	Knowledge
79	Define effective focal spot.	February 2018	Knowledge
80	Define actual focal spot.	August 2018	Knowledge
81	Define off-focus radiation.	February 2019	Knowledge
82	Define tube insert.	August 2019	Knowledge
83	Define stator.	February 2020	Knowledge
84	Define rotor.	March 2021	Knowledge
85	Define anode stem.	April 2022	Knowledge
86	Define molybdenum stem.	November 2022	Knowledge
87	Define graphite backing.	April 2023	Knowledge
88	Define tube arcing.	April 2024	Knowledge
89	Define pitting.	August 2011	Knowledge
90	Define vaporization.	February 2012	Knowledge
91	Define bearing failure.	August 2012	Knowledge
92	Define filament burnout.	February 2013	Knowledge
93	Define single exposure rating.	August 2013	Knowledge
94	Define multiple exposure rating.	February 2014	Knowledge
95	Define anodic heat capacity.	August 2014	Knowledge
96	Define housing heat capacity.	February 2015	Knowledge
97	Define cooling curve.	August 2015	Knowledge
98	Define air cooling.	February 2016	Knowledge
99	Define water cooling.	August 2016	Knowledge
100	Define ohm's law in circuits.	February 2017	Knowledge