

DIRECTORATE OF GOVERNMENT EXAMINATIONS, CHENNAI – 6
HIGHER SECONDARY EXAMINATIONS, MARCH 2011

KEY ANSWERS FOR PHYSICS

Note: For answers in Part-II, Part-III and Part-IV like Reasoning, Explanation, Narration, Description and listing of points Students may write in their own words but without changing the concepts and without skipping any point.

PART – I

(30 X 1 =30)

TYPE - A		
S.No		Answer
1	d	0.3 H
2	a	increasing the filament current
3	a	n
4	b	Series limit of Lyman series
5	a	a stream of electrons
6	d	Zero
7	c	2 NC^{-1}
8	c	$\text{N m}^2 \text{ C}^{-1}$
9	a	$1/x^2$
10	d	will remain the same
11	a	a Straight line
12	d	${}_7\text{N}^{14}$ and ${}_6\text{C}^{13}$
13	c	$\gamma \beta \alpha$
14	a	uncontrolled fission reaction
15	b	${}_{15}\text{P}^{32}$
16	a	$2.4 \times 10^{-13} \text{ N}$
17	c	the velocity of the particle
18	d	conservation of energy
19	a	AC only
20	a	only an inductor (L)
21	a	Collision
22	d	1
23	a	A
24	b	Scanning
25	b	control grid
26	d	Zero
27	c	diffraction pattern become narrow and crowded together
28	a	Maximum
29	d	$5 \times 10^{-10} \text{ s}$
30	d	Charge

TYPE - B		
S.No		Answer
1	d	zero
2	c	diffraction pattern become narrow and crowded together
3	a	maximum
4	d	$5 \times 10^{-10} \text{ s}$
5	d	charge
6	a	collision
7	d	1
8	a	A
9	b	scanning
10	b	control grid
11	a	$2.4 \times 10^{-13} \text{ N}$
12	c	the velocity of the particle
13	d	conservation of energy
14	a	AC only
15	a	only an inductor (L)
16	a	a Straight line
17	d	${}_7\text{N}^{14}$ and ${}_6\text{C}^{13}$
18	c	$\gamma \beta \alpha$
19	a	uncontrolled fission reaction
20	b	${}_{15}\text{P}^{32}$
21	d	zero
22	c	2 NC^{-1}
23	c	$\text{N m}^2 \text{ C}^{-1}$
24	a	$1/x^2$
25	d	will remain the same
26	d	0.3 H
27	a	increasing the filament current
28	a	n
29	b	series limit of Lyman series
30	a	a stream of electrons

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PART - II

- Note:** 1. For all problem type questions correct answer without unit reduce half mark
2. For wrong answers with correct unit do not award mark for unit

15 x 3 = 45

Q.No	Description	MARK	Tota
31	Correct statement (Gauss' law) (or)	3	3
	$\phi = \frac{q}{\epsilon_0}$ -----1 mark + explanation of notations -----1 mark	(or) 2	
32	Three applications (3 x 1 = 3)	3	3
33	Correct definition -----3 mark	3	3
34	If the direction of current is assumed clockwise and taken as positive. $5I + 10I + 5I = 10 - 20$ (OR) $20I = -10$ $I = -0.5 \text{ A}$	1	3
	} 1 Mark		
	The direction of current is anticlockwise. (OR) Along DCBAD(or)CBADC (or)BADCB(or)ADCBA	1	
	} 1Mark		
34	If the direction of current is assumed clockwise and taken as negative. $5I + 10I + 5I = 20 - 10$ (OR) $20I = 10$ $I = 0.5 \text{ A}$	1	3
	} 1 Mark		
	The direction of current is anticlockwise. (OR) Along DCBAD(or)CBADC(or)BADCB(or)ADCBA	1	
	} 1 Mark		
35	Correct definition. (temperature coefficient of resistance)	3	3
36	Correct statement (tangent law)	3	3
37	$e = - B\ell v$	1	3
	Substitution	1	
	$e = - 0.0164 \text{ V}$ (Numerical value ½ mark + Unit ½ mark)	1	
38	Mention three methods of inducing emf (3 x 1 =3)	3	3
39	Correct statement (Brewster's law) (or)	3	3
	$\mu = \tan i_p$ ---1 mark + Explanation of notation - 1 mark	(or) 2	

40	$\beta' = \frac{\beta}{\mu}$ or any equivalent equation	1	3								
	Correct substitution	1									
	Answer 1.5×10^{-3} m (or equivalent value) (Numerical Value $\frac{1}{2}$ + Unit $\frac{1}{2}$)	1									
41	$2d (\sin\theta) = n\lambda$ or any equivalent equation	1	3								
	substitution	1									
	Answer : 5.64×10^{-10} m or equivalent value (Numerical Value $\frac{1}{2}$ +Unit $\frac{1}{2}$)	1									
42	Correct statement of Moseley's law (OR)	3	3								
	$v \propto Z^2$ OR $\sqrt{v} = a(Z - b)$ ----- 1 mark explanation of notations ----- 1 mark } 2 marks										
43	The laws of Physics are the same in all inertial frames of reference.	$1\frac{1}{2}$	3								
	The velocity of light in free space is a constant in all the frames of reference.	$1\frac{1}{2}$									
44	${}_1\text{H}^1 + {}_1\text{H}^1 \rightarrow {}_1\text{H}^2 + {}_1\text{e}^0 + \nu$	1	3								
	${}_1\text{H}^1 + {}_1\text{H}^2 \rightarrow {}_2\text{He}^3 + \gamma$	1									
	$2 {}_2\text{He}^3 \rightarrow {}_2\text{He}^4 + 2 {}_1\text{H}^1$	1									
	(OR) $4 {}_1\text{H}^1 \rightarrow {}_2\text{He}^4 + 2 {}_1\text{e}^0 + 2 \nu + \text{energy}$ Equation alone --1 mark										
45	$\frac{N}{N_0} = \left(\frac{1}{2}\right)^n$ or any equivalent equation	1	3								
	Correct substitution	1									
	Percentage of remaining radioactive substance = 3.125	1									
	(Or) another method:	(or)									
	<table border="0"> <tr> <td>After $T_{\frac{1}{2}}$ - 50 % --- $\frac{1}{2}$ mark</td> <td>After $T_{\frac{1}{2}}$ - 1/2 --- $\frac{1}{2}$ mark</td> </tr> <tr> <td>After $2 T_{\frac{1}{2}}$ - 25 % --- $\frac{1}{2}$ mark</td> <td>After $2 T_{\frac{1}{2}}$ - 1/4 --- $\frac{1}{2}$ mark</td> </tr> <tr> <td>After $3 T_{\frac{1}{2}}$ - 12.5 % --- $\frac{1}{2}$ mark</td> <td>After $3 T_{\frac{1}{2}}$ - 1/8 --- $\frac{1}{2}$ mark</td> </tr> <tr> <td>After $4 T_{\frac{1}{2}}$ - 6.25 % --- $\frac{1}{2}$ mark</td> <td>After $4 T_{\frac{1}{2}}$ - 1/16 --- $\frac{1}{2}$ mark</td> </tr> <tr> <td>After $5 T_{\frac{1}{2}}$ - 3.125% --- 1 mark</td> <td>After $5 T_{\frac{1}{2}}$ - 3.125% --- $\frac{1}{2}$ mark</td> </tr> </table>	After $T_{\frac{1}{2}}$ - 50 % --- $\frac{1}{2}$ mark		After $T_{\frac{1}{2}}$ - 1/2 --- $\frac{1}{2}$ mark	After $2 T_{\frac{1}{2}}$ - 25 % --- $\frac{1}{2}$ mark	After $2 T_{\frac{1}{2}}$ - 1/4 --- $\frac{1}{2}$ mark	After $3 T_{\frac{1}{2}}$ - 12.5 % --- $\frac{1}{2}$ mark	After $3 T_{\frac{1}{2}}$ - 1/8 --- $\frac{1}{2}$ mark	After $4 T_{\frac{1}{2}}$ - 6.25 % --- $\frac{1}{2}$ mark	After $4 T_{\frac{1}{2}}$ - 1/16 --- $\frac{1}{2}$ mark	After $5 T_{\frac{1}{2}}$ - 3.125% --- 1 mark
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46	AA + AC + BA + BC --- ½ mark A+ AC + AB + BC --- ½ mark	1
	A(1+C+B) + BC = A + BC---1 mark [1 + C + B = 1] ---1 mark	2
47	An extrinsic semiconductor is one in which an impurity with a valency higher or lower than the valency of the pure semiconductor is added, so as to increase the electrical conductivity of the semiconductor. (OR equivalent statement)	3
48	Drawing correct circuit diagram with labeling	3
49	Any three advantages of negative feedback (3 x 1 = 3)	3
50	Correct definition (reduce ½ mark to each if sky wave propagation, fixed frequency -- not mentioned in the definition)	3

PART – III

Note: 1. For all problem type questions, correct answer without unit reduce the mark allotted For unit.

2. For wrong answers with unit do not award mark for unit alone.

7 x

= 35

Q.No	Description	MARK	Tot
51	Any five properties (5 x 1 = 5)	5	5
52	Diagram with label (Daniel Cell)	1	5
	Construction	1	
	working Daniel cell produces emf 1.08 V	- 2 marks --- 1 mark	
53	Faraday's second law of electrolysis – law	1	5
	Circuit diagram	1	
	explanation	1	
	$\frac{m_1}{m_2} = \frac{E_1}{E_2}$ ----- 1 mark ; $m \propto E$ ----- 1 mark	2	
54	Any five features (5 x 1 = 5)	5	5
55	Explanation with minimising	2	5
	1. Hysteresis loss	1	
	2. Copper loss	1	
	3. Eddy current loss (OR) Iron Loss	1	
	4. Flux loss	1	
<i>(or) Mere mentioning of four losses ---.1 Mark</i>			

