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	$N\ m^2\ C^{-1}$
9	a	$1/x^2$
10	d	will remain the same
11	a	a Straight line
12	d	$_7N^{14}$ and $_6C^{13}$
13	c	$\gamma\ \beta\ \alpha$
14	a	uncontrolled fission reaction
15	b	$_{15}P^{32}$
16	a	2.4×10^{-13} 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	5×10^{-10} 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	5×10^{-10} s
5	d	charge
6	a	collision
7	d	1
8	a	A
9	b	scanning
10	b	control grid
11	a	2.4×10^{-13} 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	$_7N^{14}$ and $_6C^{13}$
18	c	$\gamma\ \beta\ \alpha$
19	a	uncontrolled fission reaction
20	b	$_{15}P^{32}$
21	d	zero
22	c	$2\ NC^{-1}$
23	c	$N\ m^2\ C^{-1}$
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

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
	$\phi = \frac{q}{\varepsilon_0}$ -----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) } 1 Mark 20I = - 10	1	3
	I = - 0.5 A ----- 1 Mark	1	
	The direction of current is anticlockwise. (OR) } 1Mark Along DCBAD(or)CBADC (or)BADCB(or)ADCBA	1	
	(OR) If the direction of current is assumed clockwise and taken as negative. 5I + 10I + 5I = 20 – 10 (OR) } 1 Mark 20I = 10	1	3
	I = 0.5 A --- 1 Mark	1	
	The direction of current is anticlockwise. (OR) } 1 Mark Along DCBAD(or)CBADC(or)BADCB(or)ADCBA	1	
35	Correct definition. (temperature coefficient of resistance)	3	3
36	Correct statement (tangent law)	3	3
37	e = - Bℓv	1	3
	Substitution	1	
	e = - 0.0164 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 x10^{-3} m (or equivalent value) (Numerical Value ½ + Unit ½)	1	
41	2d (sinθ) = nλ or any equivalent equation	1	3
	substitution	1	
	Answer : 5.64 x 10^{-10} m or equivalent value (Numerical Value ½+Unit ½)	1	
42	Correct statement of Moseley's law (OR)	3	3
	$\upsilon \alpha Z^2$ OR $\sqrt{\upsilon} = a(Z-b)$ ---------- 1 mark explanation of notations ---------- 1 mark } 2 marks		
43	The laws of Physics are the same in all inertial frames of reference.	1½	3
	The velocity of light in free space is a constant in all the frames of reference.	1½	
44	$_1H^1 + _1H^1 \rightarrow _1H^2 + _1e^0 + \nu$	1	3
	$_1H^1 + _1H^2 \rightarrow _2He^3 + \gamma$	1	
	$2\ _2He^3 \rightarrow _2He^4 + 2\ _1H^1$	1	
	(OR) $4\ _1H^1 \rightarrow _2He^4 + 2\ _1e^0 + 2\nu$ + 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)	
	After $T_{½}$ – 50 % --- ½ mark After 2 $T_{½}$ -- 25 % --- ½ mark After 3 $T_{½}$ -- 12.5 %--- ½ mark After 4 $T_{½}$ -- 6.25 %--- ½ mark After 5 $T_{½}$ -- 3.125% --- 1 mark (OR) After $T_{½}$ – 1/2 --- ½ mark After 2 $T_{½}$ -- 1/4 --- ½ mark After 3 $T_{½}$ -- 1/8 --- ½ mark After 4 $T_{½}$ -- 1/16 --- ½ mark After 5 $T_{½}$ -- 1/32 --- ½ mark After 5 $T_{½}$ -- 3.125% ---½ mark	3	

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 – 2 marks Daniel cell produces emf 1.08 V --- 1 mark	3	
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 α E ---------- 1 mark	2	
54	Any five features (5 x 1 = 5)	5	5
55	**Explanation with minimising** 1. Hysteresis loss 2. Copper loss 3. Eddy current loss (OR) Iron Loss 4. Flux loss	2 1 1 1	5
	(or) Mere mentioning of four losses ---1 Mark		