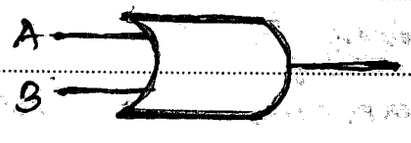
GOVERNMENT OF KARNATAKA

KARNATAKA STATE PRE-UNIVERSITY EDUCATION EXAMINATION BOARD

II YEAR PUC EXAMINATION - MARCH-2017

SCHEME OF VALUATION

Subject Code : 33 O.S. Subject : PHYSICS

Qn. No.	PART-A	Marks
I.1.	Difference between the deviations of two colours/ angular seperation.	1
2.	In sunglasses/Goggles/ headlights of automobiles/ to produced polarised light/ glass windows of buses, trains, aeroplanes etc To view 3D pictures/ to improve Contrast in old paintings etc (Any of the above)	1
3.	Volt. (V)	1
4.	A thermally sensitive or heat sensitive resistor or device.	1
5.	Angle made by earth's magnetic field strength B_H with horizontal in the magnetic meridian	1
6.	Any one type of electron emission	1
7	Rayleigh or Tyndall scattering	1
8.	Magnetic Resonance Imaging	1
9.	positron or e^+	1
10.		1

Qn. No.	PART – B	Marks
11	Definition of thin prism	1
	Expression, $d = A(n-1)$	1
12.	Any two theories of light.	1+1
13.	Defn of interference	1
	colours in thin films / Newton rings / Interference at an air wedge	1
14.	(i) λ (ii) D and (iii) d	
	Any two othe above symbolically or in words	1+1
15.	Any two i.e $n = c/v$, $\nu = c/\lambda$, $E = mc^2$, $m = \frac{h\nu}{c^2}$, $m = \frac{m_0}{\sqrt{1 - v^2/c^2}}$	1+1
16	statement of law	1
	Expression $\vec{F} = \frac{1}{4\pi\epsilon_0} \cdot \frac{q_1 q_2}{r^2} \hat{r}$	1
17	$C_s = \frac{C_1 C_2}{C_1 + C_2}$	1
	result, $C_s = 3.33\,\mu F$	1
18.	(i) Attraction	1
	(ii) Repulsion	1
19.	Defn – Device used to stepup or stepdown / used to varying A.C voltage	1
	principle ; Mutual Induction	1
20	Radio broadcasting / radar / Communication / TV transmission (Any two)	2

Qn. No.		Marks
21.	Any two properties of lasers (one each)	1+1
22.	Defn of liquid crystal	1
	Any one application	1
III.	PART – C	
23.	Diagram with direction	1
	Refraction at surface 1 arriving equation —— ①	1
	Refraction at surface 2 arriving equation —— ②	1
	Adding equn ① & ② and comparing this with $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$	1
	Final expression $\frac{1}{f} = (n-1)\left[\frac{1}{R_1} + \frac{1}{R_2}\right]$	1
24.	Defn of polarising angle	1
	Correct diagram with direction	1
	Brewster's law $n = \tan i_p$ and Snell's law $n = \frac{\sin i}{\sin r}$	1
	Comparision of above equn & others arriving final expression $i_p + r = 90^\circ$	1

Qn. No.		Marks
25.	Defn for series Combination of resistors	1
	Diagram with showing Pd and Current for three resistors	1
	$V = V_1 + V_2 + V_3$ (Arriving)	1
	Applying ohm's law $V = IR_s$ to equivalent resistor	1
	Arriving final expression $R_s = R_1 + R_2 + R_3$	1
26.	Correct diagram with showing resolved components of dB	1
	Biot Savart's law expn $dB = \frac{\mu_0}{4\pi} \frac{I\,dl \sin\theta}{a^2}$ and	1
	$B = \frac{\mu_0}{4\pi} \frac{2I\pi}{a^3} \sum dl$	1
	Where $\sum dl = \pi r n$	1
	Arriving final expression $B = \left(\frac{\mu_0}{4\pi}\right) \frac{2\pi n I r^2}{(r^2 + x^2)^{3/2}}$ T	1
27.	All the five observations of PEE (Expt)	5
	If a written 1 "	1
	" 2 " etc	2

Qn. No.		Marks
V.		
28.	principle – Controlled nuclear fission reaction	1
	Any Four distinguish between Nuclear fission and Nuclear fusion	4
29.	statement of decay law	1
	$\frac{dN}{dt} = -\lambda N$	1
	Rearranging and Integrating	
	$\log N = -\lambda t + C$	1
	Arriving $N = N_0 e^{-\lambda t}$	1
	Defn of decay Constant	1
30.	Rectification definition	1
	ckt diagram of FWR	1
	Explaination of working	2
	Input and output wave forms	1
VI.		
31.	For, $i = 60°$, $t = 0.1m$, $n = 1.5$	
	using $n = \frac{\sin i}{\sin r}$, $r = 35°16'$	1+1
	formula $L_s = \frac{t \sin(i-r)}{\cos r}$	1
	Substitution and simplification	1
	Final result $L_s = 0.0512\ m$	1

Qn. No.		Marks
32.	For $q_1 = +1.5\mu C$, $q_2 = +2.5\mu C$	
	Formula $E = \frac{1}{4\pi\epsilon_0} \cdot \frac{q}{r^2}$	1
	obtaining	
	E_1 and E_2	1
	$V = \frac{1}{4\pi\epsilon_0} \cdot \frac{q}{r}$	1
	Resultant of E_1 and E_2	
	$E = 4 \times 10^5 NC^{-1}$	1
	And obtaining total electric	
	potential $V = 2.4 \times 10^5$ volt	1
33.	For $R = (50+2)\Omega$, $L = 0.3H$	
	$C = 40\mu F$, $V_{rms} = 220V$	
	$f = 50Hz$	
	(i) Inductive reactance $X_L = 2\pi fL$	1
	$X_L = 94.25\Omega$	1
	(ii) Capacitive reactance $X_C = \frac{1}{2\pi fC}$	1
	$X_C = 79.58\Omega$	1
	(iii) Impedence $Z = \sqrt{R^2 - (X_L - X_C)^2}$	
	$Z = 54.03\Omega$	1
34.	$E_3 = \frac{E_1}{3^2} = -\frac{13.6}{9} = -1.51 eV$	1
	$E_3 - E_1 = 12.09 eV$	1
	formula $E_3 - E_1 = \frac{hc}{\lambda}$	1
	Substitution & Simplication	1
	final result $\lambda = 1027 \text{ Å}$	1

Subject Code :

Qn. No.		Marks
VII	Correct figure	1
35.	formulae	
	$f = \frac{D^2 - s^2}{4D}$, $R_1 = \frac{f x_1}{f - x_1}$, $R_2 = \frac{f x_2}{f - x_2}$	
	and $\eta = 1 + \frac{R_1 R_2}{f(R_1 + R_2)}$	1
	Expt. procedure	2
	Tabular column	1
36	Circuit diagram of S.C. diode	
	in forward Bias	1
	Nature of graph & formula	1
	for F.B resistance	
	Exptal procedure	2
	Tab column	1
VIII		
37.	formulae $R = \frac{Sl}{1 - l}$ and	
	$\rho = \frac{\pi d^2}{4L} \times R$	1
	Calculation; Resistance,	
	Trial NO 1. $R_1 = 2.993\ \Omega$, $R_2 = 2.994$	1
	$R_3 = 2.998\ \Omega$	
	Average $R = 2.992\ \Omega$	1
	ρ - substitution and simplification	1
	Final result $\rho = 0.938 \times 10^{-6}\ \Omega m$	1

Qn. No.		Marks
38.	formulae $K = \frac{1}{\tan\theta}$ and	
	$B_H = \frac{\mu_0 n K}{2r}$	1
	calculation of K;	
	Trial No 1; $K_1 = 0.09163$ A	1
	2; $K_2 = 0.09214$ A	
	Average $K = 0.09185$ A	1
	substitution and simplification in the formula B_H,	1
	Final result $B_H = 3.6074 \times 10^{-5}$ T	1
	PART- D	
IX		
39.		
a)	Formula $d\theta = \frac{1.22\lambda}{D}$	1
	For $\lambda = 546$ nm	
	$D = 1.2$ m	
	substitution and	
	simplification for $d\theta$	1
	$d\theta = 4.514 \times 10^{-7}$ rad.	1
	$R.P = \frac{1}{d\theta} = \frac{1}{4.514 \times 10^{7}}$	
	$RP = 0.2215 \times 10^{7}$ rad^{-1}	1

Qn. No.		Marks
b)	Diagram of capacitor connected to a source of P.d	1
	Expression by defn. $C = \frac{q}{V'}$ and $dW = V' dq$	1
	$\therefore W = \int_0^Q dW = \int_0^Q V' dq$	
	$= \int_0^Q \frac{q}{C} dq = \frac{1}{C}\int_0^Q q\, dq$	1
	Arriving final expression $E = \frac{1}{2}CV^2 = \frac{1}{2}\frac{Q^2}{V} = \frac{1}{2}QV$ //	1
c)	Statement of both laws of electromagnetic induction i.e Faradays laws of EMI	1+1
40.		
a)	formula $\lambda = \frac{h}{mv}$	1
	Substitution and simplification of above equn	2
	final result $\lambda = 8.281 \times 10^{-34}$ m	1

Qn. No.		Marks
b)	Statement of two (both) Kirchoff's laws of electrical network	1+1
	Explaination with ckt diagrams for both laws (each one mark)	1+1
c)	Defn of an ammeter	1
	Conversion of galvanometer to an ammeter either in words or ckt	1