

CSS Past Papers Subject: Physics Year: 2016

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PHYSICS, PAPER-I

TIME ALLOWED: THREE HOURS PART-I(MCQS): MAXIMUM 30 MINUTES		PART-I (MCQS) PART-II	MAXIMUM MARKS = 20 MAXIMUM MARKS = 80					
 NOTE: (i) Part-II is to be attempted on the separate Answer Book. (ii) Attempt ONLY FOUR questions from PART-II. ALL questions carry EQUAL marks. (iii) All the parts (if any) of each Question must be attempted at one place instead of at different 								
(iv) (v)	places. Candidate must write Q. No. in the Answer Book in accordance with Q. No. in the Q.Paper. No Page/Space be left blank between the answers. All the blank pages of Answer Book must be crossed.							
(vi) (vii)	Extra Use o	Extra attempt of any question or any part of the attempted question will not be considered. Use of Calculator is allowed.						
PART-II								
Q. No. 2.	(a) (b)	State and prove Stoke's theorem Prove that if the vector is the g around a closed curve is zero.	n. gradient of a scalar functi	on then its line integral	(8) (4)			
	(c) A particle moves along the curve $\mathbf{x} = 2\mathbf{t}^2$, $\mathbf{y} = \mathbf{t}^2 - 4\mathbf{t}$, $\mathbf{z} = 3\mathbf{t} - 5$ where t i time. Find the components of its velocity and acceleration at time $\mathbf{t} = 1$ in direction $2\mathbf{i} - 3\mathbf{j} + 2\mathbf{k}$							
Q. No. 3.	(a) What is moment of inertia? State and prove parallel axis theorem.(b) Calculate rotational inertia of a hollow cylinder about cylindrical axis.				(12) (8)			
Q. No. 4.	(a)	State and prove the Kepler's	law of areas and Kepl	er's law of periods of	(8)			
	(b)	A satellite orbits at a height of pariod of satellite?	of 230km above the Eart	th surface. What is the	(6)			
	(c)	At what altitude above the earth value at the surface of the earth.	h surface the value of 'g	' is three quarters of its	(6)			
Q. No. 5.	(a)	What is diffraction grating? Ex	plain how grating diffrac	ts light. Derive relation	(12)			
	(b)	for resolving power of grating. What is meant by polarization of light? How can we get a plane polarized light by a polarizing sheet?						
Q. No. 6. (a) Derive equation of Lorentz velocity transfor			elocity transformations a	ns and show that speed of (12)				
	(b)	The siren of a police car emits a frequency that would you receiv (i) Your car at rest, police c (ii) Police car at rest, your c (iii) Your and police car are t (iv) Your car moving at 9 m	source tone at a frequence in your car under the for ar moving towards you at ear moving towards it at 2 moving towards one another 's, police car chasing behi	by of 1125 Hz. Find the ollowing circumstances. t 29 m/s. 9 m/s. her at 14.5 m/s. nd you at 38 m/s.	(8)			
Q. No. 7.	(a) (b) (c)	Define Entropy. State Second law of thermodynamics in terms of Entropy. Discuss applications of First Law of thermodynamics. Discuss briefly the Lissajous patterns.			(8) (6) (6)			
Q. No. 8.	Explai (a) (b) (c) (d)	n any FOUR of the following ter Doppler's Effect Bernoulli's theorem Newton's rings He-Ne Gas LASER	ms.	(05 each)	(20)			

Brownian motion

(e)



FEDERAL PUBLIC SERVICE COMMISSION COMPETITIVE EXAMINATION-2016 FOR RECRUITMENT TO POSTS IN BS-17 UNDER THE FEDERAL GOVERNMENT

PHYSICS, PAPER-II

TIME AL	LOV ICQ	VED: THREE HOURS S): MAXIMUM 30 MINUTES	PART-I (MCQS) PART-II	MAXIMUM MARKS MAXIMUM MARKS	b = 20 b = 80			
NOTE: (i) Part-II is to be attempted on the separate Answer Book.								
(ii) Attempt ONLY FOUR questions from PART-II. ALL questions carry EQUAL marks.								
(iii	i) Al	ll the parts (if any) of each Question	n must be attempted at o	ne place instead of at di	fferent			
Giv	p_{1}	aces. \mathbf{O} and \mathbf{O} in the Ans	wer Book in accordance	with O No in the O Pan	er			
(IV (V)	N	o Page/Space be left blank between	the answers. All the blan	nk pages of Answer Bool	k must			
	be	e crossed.		1.6				
(vi)	E	xtra attempt of any question or any pa	art of the attempted quest	ion will not be considered	1.			
(vii) U	se of Calculator is allowed.						
			PART-II					
Q. No. 2.	(a)	Define electric field intensity \vec{E} . Sta	te its value for a point ch	arge and give its units.	(8)			
	(b) State differential form of Gauss's law and from there develops the poisson's & Laplace's equations.							
	(c)	A charge of $10\sqrt{2}$ Coulomb is locat	ted at $(3\hat{i} + 4\hat{j} + 5\hat{k})n$	ι. Calculate the electric	(4)			
		field intensity at a point having posi	tion vector $(5\hat{i} + 4\hat{j} +$	$3\hat{k})m.$				
				,				
Q. No. 3.	(a)	Differentiate between a series and p	parallel resonant circuits.		(6)			
	(b)	Explain the construction and operat a transformer and how are they redu	tion of a transformer. What we have to a minimum.	at are energy losses in	(10)			
	(c)	A series <i>LCR</i> circuit contains a contain a resistor with $R=50\Omega$. Calcibetween current and voltage. (Take	bil with $L=2.25$ H, a cap ulate the impedance and frequency $f = 50$ Hz)	acitor having $C=16\mu$ F d the phase difference	(4)			
O. No. 4.	(8)	State and explain the basic postulat	tes of Quantum Physics		(5)			
Q1 100 II	(u) (b)	Briefly explain with examples what	do vou mean by Eigen fun	ction and Eigen values.	(5)			
	(c)	Derive the time-dependent Schrodin	nger Wave Equation for a	free particle.	(10)			
	. ,	-	0 1	1	()			
Q. No. 5.	(a)	Why the resistivity of metals incre decreases?	ases with temperature bu	t that of semiconductor	(6)			
	(b)	In the process of making semico Germanium?	nductor devices, why si	licon is preferred over	(4)			
	(c)	Briefly explain the construction at (BJT). How it can be used as an Am	nd operation of a Bipo pplifier?	ar Junction Transistor	(10)			
O. No. 6.	(a)	What do <111>, [010], (111), and {	100} represents for a cut	vic crystal lattice.	(5)			
	(b)	What is packing factor? Determine	the Atomic Packing facto	or of FCC lattice.	(5)			
	(c)	With neat diagram showing X-ray dia	ffraction, derive an express	sion for Bragg's Law.	(10)			
o N -	F		1					
Q. No. 7.	De	tine Curie and Becquerel. Establish the curie $\frac{14}{2}$	he relation between them.		(6)			
	Ca.	to and explain Helf life and Mass li	find the redipositive of $5/30$	years. Show that $< T > \frac{1}{2}$	(4)			
	Sta gre	the and explain Half-life and Mean II rater than $T_{1/2}$.	ie of a radioactive eleme	such show that $< 1 > 1$ s	(10)			