

## FEDERAL PUBLIC SERVICE COMMISSION COMPETITIVE EXAMINATION FOR RECRUITMENT TO POSTS IN BPS-17 UNDER THE FEDERAL GOVERNMENT, 2010 PHYSICS, PAPER-I

FINAL PUBLIC SERVICE COMMISSION COMPETITIVE EXAMINATION FOR RECRITMENT TO POSTS IN RPS-17 UNDER THE FEDERAL GOVERNMENT, 2010 PHYSICS, PAPER-1  TIME ALLOWED: (PART-1) 30 MINUTES MAXIMUM MARKS:20 MAXIMUM MO: Di Co Co 2 0 (d) None of these  (vi) A force acieting on a particle is conservative if: (a) It obeys Newton's second law (b) It obeys Newton's second law (c) It works equals the change in Kinetic energy (d) None of these  (vii) A torque applied to a rigid object always tends to produce: (a) A rotational acceleration (b) A force acting on a particle is conservative if: (a) It obeys Newton's second law (c) It works equals the change in Kinetic energy (d) None of these  (vii) In the absence of external torque the total angular momentum is: (a) Constant (b) Zero (c) Impulse (d) None of these  (xii) The rate of change of Momentum of the particle is: (a) Energy (b) Force (c) Infinity (d) None of th	DHYGI	CG BADED I				SE
(iii) Use of Scientific Calculator is allowed.  PART — I (MCQ) (COMPULSORY)  Q.1. Select the best option/answer and fill in the appropriate box on the Answer Sheet. (20)  (i) If A= 6i-8j, then 4A has the magnitude: (a) 40 (b) 10 (c) 20 (d) None of these  (ii) Let A= 2i+6j-3k and B= 4i+2j+k then A.B equals: (a) 8i+12j-3k (b) 17 (c) 23 (d) None of these  (iii) If V is an operator, then V.V means: (a) Gradient of a Scalar field (d) None of these  (iv) The volume of a parallelepiped bounded by Vectors A,B and C can be obtained from the expression: (a) (A x B ).C (b) (A.B)x C (c) (A x B) x C (d) None of these  (v) A force acting on a particle is conservative if: (a) It obeys Newton's third law (b) It obeys Newton's second law  (c) It works equals the change in Kinetic energy (d) None of these  (vi) A torque applied to a rigid object always tends to produce: (a) A rotational acceleration (c) Precision (d) None of these  (vii) When the velocity of a body is constant, its acceleration is: (a) Maximum (b) Zero (c) Infinity (d) None of these  (xi) The rate of change of Momentum of the particle is: (a) Energy (b) Force (c) Impulse (d) None of these  (xi) The rate of change of Momentum of the particle is: (a) Polarisation (b) Interference (c) Diffraction (d) None of these  (xi) The intensity of a wave is proportional to the squarer of: (a) A mplitude (b) Time (c) Intensity (d) None of these  (xii) The colours in soap bubbles, oil slick etc. in a thin film is due to: (a) Diffraction (b) Polaristation (c) Interference (d) None of these  (xii) The ritensity of a wave is proportional to the squarer of: (a) A pullitude (b) Time (c) Interference (d) None of these  (xii) The intensity of a wave is proportional to the squarer of: (a) Algentumber of ruling (b) San Interference (d) None of these  (xii) The intensity of a wave is proportional to the squarer of: (a) Largen umber of ruling (b) San Interference (d) None of these  (xiii) For higher resolution, in a diffraction grating, one needs to have: (a) Largen umber of ruling (b) Ru	* ) = 1   1   1   1   1   1   1   1   1   1	FEDERAL PUBLIC SERVICE COMPETITIVE EXAMINATION RECRUITMENT TO POSTS IN BPS-1 THE FEDERAL GOVERNMENT,	FOR 17 UN	R NDER	Roll	Number Control
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(a) The temperature of the system remains constant The temperature of the system must change

The internal energy of the system remains constant

(b)

(c)

None of these

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(xiz	()	(a) 44% (b) 20% (c) 79% (d) None of Metals pipe carrying water some times bursts in winter because: (a) Water expands (b) Ice expands when melts	TOU					
(xx		(c) Metal contracts more than water (d) None of these A Fahrenheit thermometer and Celsius thermometer shows the same reading at: (a) 200° (b) -40° (c) 100° (d) None of these	se Milita					
PHYSICS, PAPER-I  (xviii) A Carnot Cycle heat engine operates between 227°C and 127° C. Its efficiency is:  (a) 44% (b) 20% (c) 79% (d) None of the semantic structure of the								
NOT	E:	<ul> <li>(i) PART-II is to be attempted on the separate Answer Book.</li> <li>(ii) Attempt ONLY FOUR questions from PART-II. All questions carry EQUAL marks.</li> <li>(iii) Extra attempt of any question or any part of the attempted question will not be considered.</li> <li>(iv) Use of Scientific calculator is allowed.</li> </ul>						
Q.2.	(b)	Define a Scalar field, obtain an expression for the Gradient of a Scalar field. Why the gradient Scalar field is Vector? Given $\Phi(x,y,z)=x^2yz^3$ , find grad $\Phi$ at (1,2,1). For what values of 'a', the vector $A=2i+aj+k$ and $B=4i-2j-2k$ are perpendicular.	of a (11) (05) (04)					
Q.3.	(b)	Distinguish between Linear and Angular Momentum. Explain the law of Conservation of Angu Momentum. Prove that the Angular momentum is constant in the absence of external torque. The angular momentum J of a particle is given as J=8t $^4$ i - 2t $^2$ j + 12t $^3$ k, Find the torque $\tau$ at t = 1						
Q.4.	(b) (c)	What is time dilation? Explain with example.  When we say that a clock in moving frame runs slower than a clock in a stationary frame.	(05) (11) (04)					
Q.5.	(b) (c)	What is "Coefficient of viscosity"? Explain in detail the Stoke's law applicable in determining	(03) (14) : : : : : : :					
Q.6.	(b)	We wish to use a Quartz sheet $(n=1.54)$ in air as polarizer. Find the polarizing angle and angle of refraction.	(13) (05) (02)					
Q.7.	(b)	Define Internal energy. State and explain First and Third laws of thermodynamics. What is a heat engine? Determine the efficiency of the engine if it takes 10,000 J of heat and delivers 2000 J of work per cycle.	(14) (06)					
Q.8.		Write notes on <b>ANY TWO:</b> (a) Centre of Mass (b) Diffraction Grating and Resolving Power (c) Production of low Temperature.	(20)					

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