

2015 O level Pure Physics 5059 Paper 1 (MCQ) Suggested Answers

D number of times it passes through y (21 times) as that first pass-through ont contribute to any of the timed oscillations. T is the total time taken fo oscillations, hence 1 period must be T/10. B Initially the box experiences acceleration of 10 m/s². As it falls, accelerated decreases due to the increase in air resistance. Terminal velocity is reached a decreases due to the increase in air resistance. Terminal velocity is reached in some time as air resistance = weight of the box. Graph 1 & 4 illustrate explanation. B B C Based on Netwon's third law, for every action, there is an equal and opport reaction F = ma	Question	Answer	Explanation
2 D Vector quantities MUST include direction. Both velocity and weight (a force) has direction. Option A: Resultant greater than 4 N Option C: Resultant greater than 4 N Option C: Resultant search than 4 N B as cell and than 4 State search than 4 N Option C: Resultant search than 4 N Option C: Resultant search than 4 N B as cell and than 4 State search than 4 N Option C: Resultant search than 4 N B cell and than 4 State search than 4 N Option C: Resultant search than 4 N B cell and than 4 State search than 4 N Option C: Resultant search than 4 N Option C: Resultant search than 4 N Option C: Resultant search than 4 N B cell and than 4 State search than 4 N Option C: Resultant search than 4 N D center of gravity of an irregular object must be at the heavier side. P cell and than 4 N Option C: Resultant search than 4 N Option C: Resultant search than 4 N D center of gravity of an irregular object must be at the heavier side. P cell and than 4 N Option C: Resultant search than 4 N Option C: Resultant search search than 4 N Option C: Resultant search search search search search search se	1	С	
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i i			$m\theta = m\theta$ 1 x (80 - p) = 5 x (p - 20)
	19	В	Mixture of liquid and solid → substance is melting.
	20	А	L = Q / m where Q is the amount of energy and m is the mass. => Since electrical energy is given, from the formula, $L = Q / m$, mass of ice is required in order to

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21	С	Known Fact
		12 wavelengths => 60 s
22	Α	1 wavelength => 5 s
		f = 1/ T = 1/5 = 0.20 Hz
23	С	As water moves from deep region to shallow region, this will cause a decrease in speed and decrease in wavelength.
24	С	Sound waves are longitudinal and Option A, B and D are transverse waves.
25		Since $n = \frac{\sin i}{\sin r}$, therefore $\sin i = n \sin r$. So $\sin i$ will be directly proportional to $\sin r$
	А	r. In options B and C, sin i and sin r are inversely proportional. In option D, the gradient of the line is less than 1, which is not possible as $n = 1$ for vacuum.
26	С	Converging lens focuses/converges light rays to a point called the focal point. Only rays in Option C will meet at a point.
27	В	Image is formed behind the object/ on the same side as the object. Therefore, object must be in front of the focal length. Hence Options A and D are wrong. Using similar triangles, we get $\frac{h_i}{h_o} = \frac{d_i - f}{f}$, where h = height, d = distance from
		centre of lens, $i = image$ and $o = object$. Solving this equation $f = 3.0cm$. $v = f \lambda$,
28	Α	$\lambda = 1 \text{ A},$ $\lambda = \text{V/f} = 1400 \text{ m/s} \div (2 \times 10^6) = 7.0 \times 10^{-4} \text{ m}$
29	А	Distance travelled = speed x time taken. Since time taken is between transmitting and receiving the signal, distance travelled is doubled, which must then be halved to get the answer. Time to transmit only = 0.40s / 2 = 0.20 s 1500 x 0.20 = 300 m
30	А	When X is brought close to Y, the side of Y nearer to X is induced with negative charges and the right side of sphere Y is made up of positive charges. When sphere Y is earthed, electrons from Earth flow into Y to neutralize positive charges in Y. When X is moved far away, sphere Y becomes negatively charged.
31	С	I = Q/t = 60/15 = 4 A
32	В	Resistors in parallel have the least effective resistance while resistors in series have the greatest effective resistance. Network W = 4 Ω , network X = 40 Ω , network Y = 25 Ω
33	С	Current through 1 ohm resistor => 5 + 2 = 7A (total current) p.d across 1 ohm resistor = I x R = 5 x 1 = 5V p.d across 1 ohm resistor = p. d across 2.5 ohm resistor Total p.d = voltmeter reading = 5 + 7 = 12 V
34	D	Light intensity increases => resistance of LDR drops => Current in the circuit increases => ammeter reading increases. Since the circuit is in series, if the current in the circuit increases, voltage reading across the resistor also increases.
35	В	60 W = 0.06 kW In 10 hours: 0.06 x 10 = 0.6 kWh Cost = 0.6 x 0.3 = \$ 0.18
36	D	Live wire connects directly to the switch, neutral wire completes the circuit and earth wire connects to the metal casing.
37	С	Magnetic field must be in one direction and only option C shows this.
38	D	For an induced current to be produced, the coil must cut the magnetic field lines of the magnet. In a vertical position, the magnetic field lines are not being cut by the coil. This happens when one side of the coil is at the top or bottom of its turn.
39	А	Current in the secondary coil => 12V/8 = 1.5 A $ \frac{V_p}{V_s} = \frac{I_s}{I_p} & \frac{240}{12} = \frac{1.5}{I_p} \\ & => I_p = 0.075 A $
40	D	From the graph, 1 period = 4 cm $4 \text{ cm} \Rightarrow 0.020 \text{ s}$ $1 \text{ cm} \Rightarrow 0.020 / 4 = 5 \text{ ms}$