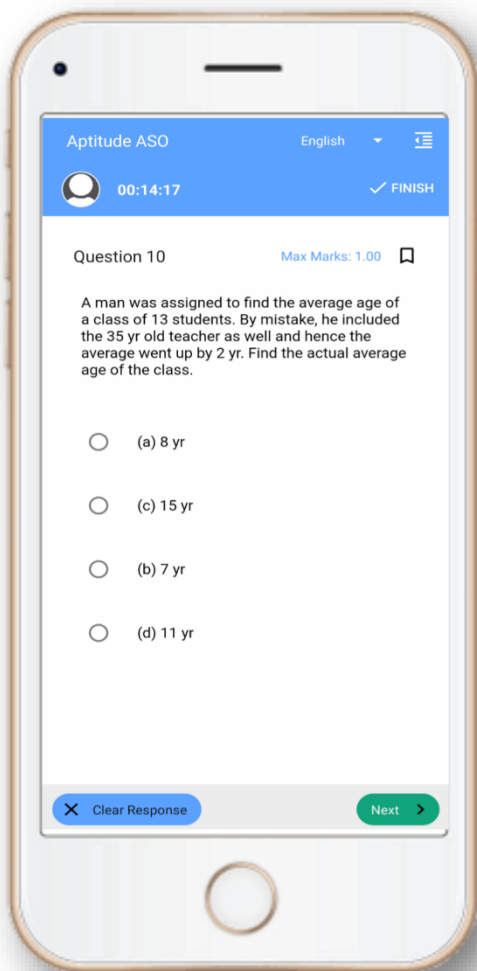


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B - SECTION - III

SCIENCE (PCM)

PHYSICS

41. Specific heat at constant pressure and specific heat at constant volume of nitrogen gas respectively in terms of gas constant R are
- (A) $\frac{3}{2}R, \frac{5}{2}R$
 (B) $\frac{5}{2}R, \frac{7}{2}R$
 (C) $\frac{7}{2}R, \frac{5}{2}R$
 (D) $\frac{5}{2}R, \frac{3}{2}R$
42. The temperature at which velocity of sound will be double of its room temperature (27°C) value is
- (A) 54°C (B) 300°C
 (C) 927°C (D) 1200°C
43. Length of a string tied to two rigid supports is 20 cm. Maximum wavelength of a stationary wave produced on it is
- (A) 10 cm
 (B) 20 cm
 (C) 40 cm
 (D) 80 cm
44. The velocity of light in water of refractive index $\frac{4}{3}$ in ms^{-1} is
- (A) 1.33×10^8
 (B) 2.25×10^8
 (C) 3×10^8
 (D) 4×10^8
45. An object is placed between the focus and pole of a double convex lens. The image is
- (A) virtual, erect and magnified
 (B) virtual, erect and diminished
 (C) real, inverted and magnified
 (D) real, erect and diminished
46. If the kinetic energy of a body is doubled then its momentum increases by
- (A) 2 times
 (B) 4 times
 (C) $\sqrt{2}$ times
 (D) 8 times

47. If the horizontal range of a projectile is 64 m then the maximum height attained by the projectile is
- (A) 16 m
(B) 32 m
(C) 64 m
(D) 128 m
48. Work done when a force $\vec{F} = (2\hat{i} - 3\hat{j} + 5\hat{k})N$ acting on a particle takes it from the point $\vec{r}_1 = (\hat{i} + 2\hat{j} - 3\hat{k})m$ to the point $\vec{r}_2 = (3\hat{i} + 5\hat{j} + \hat{k})m$ is
- (A) 7 J (B) 15 J
(C) 25 J (D) 38 J
49. What is the ratio of potential energy to kinetic energy of a body executing simple harmonic motion when the displacement is equal to one-third of the amplitude?
- (A) 1 : 8
(B) 8 : 1
(C) 1 : 3
(D) 1 : 9
50. If the earth expands to twice of its present radius then duration of the day will be
- (A) 6 hours
(B) 12 hours
(C) 24 hours
(D) 96 hours
51. The minimum magnifying power of a telescope is M . If the focal length of its eye-piece is halved its magnifying power will be
- (A) $\frac{M}{2}$
(B) M
(C) $2M$
(D) $4M$
52. If in a Young's double slit experiment the distance between the two slits is halved and the distance between the slit and the screen is doubled, then fringe width
- (A) remains the same
(B) decreases by 4 times
(C) increases by 4 times
(D) increases by 2 times

53. The flux associated with each wall of a cube having a charge Q at its centre is
- (A) $\frac{Q}{\epsilon_0}$ (B) $\frac{Q}{2\epsilon_0}$
 (C) $\frac{Q}{4\epsilon_0}$ (D) $\frac{Q}{6\epsilon_0}$
54. The potential on the surface of a thin spherical shell of radius 10 cm is 10 V. The potential at a distance of 5 cm from the centre of the shell is
- (A) 0 V (B) 5 V
 (C) 10 V (D) 20 V
55. Ten capacitors, each of capacitance $10 \mu\text{F}$ are first connected in series and then in parallel. The ratio of equivalent capacitance in series to equivalent capacitance in parallel is
- (A) $\frac{1}{100}$ (B) ~~100~~
 (C) $\frac{1}{10}$ (D) 10
56. The relation between escape velocity (v_e) and orbital velocity (v_o) on the surface of the earth is
- (A) $v_e = \sqrt{2} v_o$
 (B) $v_e = 2 v_o$
 (C) $v_o = \sqrt{2} v_e$
 (D) $v_o = 2 v_e$
57. If the distance between the sun and the earth is doubled then the duration of the year will be
- (A) 2 years
 (B) $2\sqrt{2}$ years
 (C) 4 years
 (D) 8 years
58. Young's modulus of steel is
- (A) equal to that of rubber
 (B) less than that of rubber
 (C) greater than that of rubber
 (D) none of the above
59. A solid sphere of radius R is falling in a viscous medium. The terminal velocity attained by the falling body will be proportional to
- (A) R^2
 (B) R
 (C) $\frac{1}{R}$
 (D) $\frac{1}{R^2}$
60. A liquid will not wet the surface of a solid if the angle of contact is
- (A) 0° (B) 45°
 (C) 60° (D) 120°