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USE OF ENGLISH

21. Obi and.....participated in the tournament. A. him B. his C. he D. her E. hers
22. Emeka is one of the boys who always.....good work. A. does B. would do C. done D. should do E. do
23. The policemen who were to keep watch connived.....robbers to escape. A. with B. at C. to D. for E. as
24. He claimed that MrOkoli’s utterance was tantamount to defamation of character, so he sued for.....A. damage B. some damage C. a damage D. damages E. damages
31. The binary operation is defined on the set of integers such that $x + y = xy + x - y$. find $2 * (3 * 4)$. A. 11 B. 13 C. 25 D. 22 E. 23
32. Evaluate $\int_0^{\pi/2} \sin 2x \, dx$. A. π B. 2π C. 1 D. 10 E. 3
33. Find x if $\log_9 9 + \log_3 3 = 2.5$
A. 2 B. 3 C. 4 D. 2.5 E. 1

PHYSICS

41. A car traveling at 50km/hr decelerates uniformly at $1.8m/s^2$. Calculate the distance it travels before it stops. A. 1.80m B. 50.0m C. 53.59m D. 55.39m E. 5.35m
42. A body of mass 50kg slides down freely on a frictionless plane which is inclined at an angle of 30° to the horizontal. What force is pushing the body down the incline? A. 542N B.200N C.245N D.50N E. 30N

SOLUTION TO FUTO 2013/2014 POST UTME DAY 1

Temperature = 373K, Pressure = 1.15atm, R = 0.082atm-dm³/k-mol,
Molar mass of NH₃ = 14 + 3(1) = 14 + 3 = 17g/mol, density of NH₃ = ?

$$\begin{aligned} \text{Density of NH}_3 &= \frac{273k / 1.15atm \times 0.082atm / 3}{17g/mol} \\ &= \frac{26.596}{17g/dm^3} = 1.56g/dm^3 \text{ Ans: B} \end{aligned}$$

$$\text{no. of moles} = \frac{\text{no. of atoms}}{N_A} = \frac{3.52 \times 10^{24}}{6.02 \times 10^{23}} = 5.85 \text{ moles} \quad \text{Ans: B}$$

$$\text{From: } \frac{\text{given mass}}{\text{molar mass}} = \frac{\text{no. of atoms}}{N_A}$$

$$\text{given mass} = \frac{\text{molar mass} \times \text{no. of atoms}}{N_A} = \frac{197 \times 9.70 \times 10^{23}}{6.02 \times 10^{23}} = 317.32g \quad \text{Ans: E}$$

E

Initial volume $V_1 = 2000L$

Initial temperature $T_1 = 20^\circ C = 293K$

Final temperature, $T_2 = 33^\circ C = 308K$

Final volume, $V_2 = ?$

$$\text{From, } \frac{V_1}{T_1} = \frac{V_2}{T_2}$$

$$V_2 = \frac{V_1 \times T_2}{T_1} = \frac{2000 \times 308}{293} = \frac{61600}{293} = 2102.4L \quad \text{Ans: B} \quad 6. D \quad 7. C$$

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