GATE Questions 22

EE24BTECH11012 - Bhavanisankar G S

1) If $\rightarrow$ denotes increasing order of intensity, then the meaning of the words [dry $\rightarrow$ arid $\rightarrow$ parched] is analogous to [diet $\rightarrow$ fast $\rightarrow$ _____]. Which one of the given options is approriate to fill the blank ?

   a) starve   b) reject   c) feast   d) deny

2) If two distinct non-zero variables x and y are such that $(x + y)$ is proportional to $(x - y)$ then the value of $\frac{x}{y}$
   a) depends on xy
   b) depends only on x and not on y
   c) depends only on y and not on x
   d) is a constant

3) Consider the following sample of samples :
   9, 18, 11, 14, 15, 17, 10, 69, 11, 13
   The median of the sample is

   a) 13.5   b) 14   c) 11   d) 18.7

4) The number of coins of rupees 1, rupees 5 and rupees 10 denominations that a person has are in the ratio 5:3:13. Of the total amount, the percentage of money in 5 rupee coins is

   a) 21 %   b) $14\frac{2}{7}$%   c) 10 %   d) 30 %

5) For positive non-zero real variables p and q, if

   $$\log p^2 + q^2 = \log p + \log q + 2\log 3$$

   then, the value of $\frac{p^4+q^4}{p^2q^2}$ is

   a) 79   b) 81   c) 9   d) 83

6) In the given text, the blanks are numbered (i) - (iv). Select the best match for all the blanks.
   Steve was advised to keep his head (i) _____ before heading (ii) _____ to bat ; for, while he had a head (iii) _____ batting, he could only do so with a cool head (iv) _____ his shoulders.
   a) (i) down (ii) down (iii) on (iv) for
   b) (i) on (ii) down (iii) for (iv) on

c) (i) down (ii) out (iii) for (iv) on

d) (i) on (ii) out (iii) on (iv) for

7) A rectangular paper sheet of dimensions $54cm \times 4cm$ is taken. The two longer edges of the sheet are joined together to create a cylindrical tube. A cube whose surface area is equal to the area of the sheet is also taken.

Then, the ratio of the volume of the cylindrical tube to the volume of the cube is
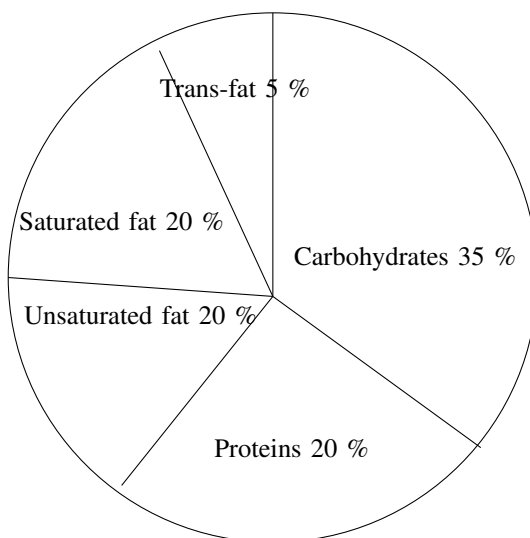
a) $\frac{1}{\pi}$ b) $\frac{2}{\pi}$ c) $\frac{3}{\pi}$ d) $\frac{4}{\pi}$

8) The pie chart presents the percentage contribution of different macro-nutrients to a typical 200 kCal diet of a person.

The typical energy density (kCal/g) of these macro-nutrients is given in the table.

| Macronutrient	Energy density (kCal/g)
Carbohydrates	4
Proteins	4
Unsaturated fat	9
Saturated fat	9
Trans fat	9

The total fat (all three types), in grams, this person consumes is

a) 44.4 b) 77.8 c) 100 d) 3,600

9) A rectangular paper of $20cm \times 8cm$ is folded 3 times. Each fold is made along the line of symmetry, which is perpendicular to its long edge. The perimeter of the final folded sheet (in cm) is

a) 18 b) 24 c) 20 d) 21

10) The least number of squares to be added in the figure to make AB a line of symmetry is
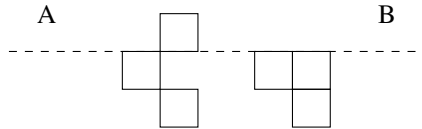
a) 6 b) 4 c) 5 d) 7

11) The following system of linear equations

$$7x - 3y + z = 0$$
$$3x - y + z = 0$$
$$x - y - z = 0$$

has

a) infinitely many solutions
b) a unique solution
c) no solution
d) three solutions

12) The acceleration of a body travelling in a straight line is given by

$$\alpha = -C_1 - C_2 v^2$$

where v is the velocity, and C_1, C_2 are positive constants. Starting with an initial positive velocity v_0, the distance travelled by the body before before coming to rest for the first time :

a) $\frac{1}{2C_2} \ln\left(1 + \frac{C_2}{C_1} v_0^2\right)$
b) $\frac{1}{2C_2} \ln\left(1 - \frac{C_2}{C_1} v_0^2\right)$
c) $\frac{1}{2C_2} \ln\left(C_1 + C_2 v_0^2\right)$
d) $\frac{1}{2C_2} \ln\left(1 + C_2 v_0^2\right)$

13) The three dimensional stress-strain relationship for an isotropic material is given as

$$\begin{pmatrix} \sigma_{xx} \\ \sigma_{yy} \\ \sigma_{zz} \\ \tau_{yz} \\ \tau_{xz} \\ \tau_{xy} \end{pmatrix} = \begin{pmatrix} P & Q & Q & 0 & 0 & 0 \\ Q & P & Q & 0 & 0 & 0 \\ Q & Q & P & 0 & 0 & 0 \\ 0 & 0 & 0 & R & 0 & 0 \\ 0 & 0 & 0 & 0 & R & 0 \\ 0 & 0 & 0 & 0 & 0 & R \end{pmatrix} \begin{pmatrix} \epsilon_{xx} \\ \epsilon_{yy} \\ \epsilon_{zz} \\ \epsilon_{yz} \\ \epsilon_{xz} \\ \epsilon_{xy} \end{pmatrix}$$

where, P, Q and R are the three elastic constants, σ and τ represent normal and shear stresses, and ϵ and γ represent normal and engineering shear strains. Which one of the following options is correct ?

a) $R = \frac{P-Q}{2}$ b) $R = \frac{Q-P}{2}$ c) $Q = \frac{P-R}{2}$ d) $Q = \frac{R-P}{2}$