GATE Questions 6

EE24BTECH11012 - Bhavanisankar G S

1) $\lim_{n\to\infty} \int_0^1 s_n(x)dx = 1$
   a) by dominated convergence theorem
   b) by Fatou's theorem
   c) by the fact that $\{s_n\}$ converges uniformly on $[0, 1]$
   d) by the fact that $\{s_n\}$ converges pointwise on $[0, 1]$

   The matrix $A = \begin{pmatrix} 1 & 1 & 1 \\ 2 & 1 & 2 \\ 1 & 3 & 2 \end{pmatrix}$ can be decomposed into the product of a lower triangularmatrix L and an upper triangular matrix U as A=LU where

$$L = \begin{pmatrix} 1 & 0 & 0 \\ l_{21} & 1 & 0 \\ l_{31} & l_{32} & 1 \end{pmatrix}; U = \begin{pmatrix} u_{11} & u_{12} & u_{13} \\ 0 & u_{22} & u_{23} \\ 0 & 0 & u_{33} \end{pmatrix}$$

   Let $x, z \in \mathbb{R}^3$ and $b = \begin{pmatrix} 1 & 1 & 1 \end{pmatrix}$

2) The solution $z = \begin{pmatrix} z_1 & z_2 & z_3 \end{pmatrix}$ of the system $Lz = b$ is

   a) $\begin{pmatrix} -1 & -1 & -2 \end{pmatrix}$
   b) $\begin{pmatrix} 1 & -1 & 2 \end{pmatrix}$
   c) $\begin{pmatrix} 1 & -1 & -2 \end{pmatrix}$
   d) $\begin{pmatrix} -1 & 1 & 2 \end{pmatrix}$

3) The solution $x = \begin{pmatrix} x_1 & x_2 & x_3 \end{pmatrix}$ of the system $Ux = z$ is

   a) $\begin{pmatrix} 2 & 1 & -2 \end{pmatrix}$
   b) $\begin{pmatrix} 2 & 1 & 2 \end{pmatrix}$
   c) $\begin{pmatrix} -2 & -1 & -2 \end{pmatrix}$
   d) $\begin{pmatrix} -2 & 1 & -2 \end{pmatrix}$

4) Choose the most appropriate word from the options given below to complete the following sentence.
   It was her view that the country's problems had been (blank) by foreign technocrats, so that to invite them to come back would be counter productive

   a) identified b) ascertained c) exacerbated d) analysed

5) There are two candidates P and Q in an election. During the campaign, 40 % of the voters promised to vote for P and rest for Q. However, on the day of election, 15 % of the voters went back on their promise to vote for P and instead voted for Q. 25 % of the voters went back on their promise tovote for Q instead of P. Suppose, P lost by 2 votes, then what was the total numbers of voters.

   a) 100 b) 110 c) 90 d) 95

6) The question beow consists of a pair of related words followed by four pairs of words. Select the pair that best expresses the relation in the original pair.
   Gladiator : Arena

   a) dancer:stage
   b) commuter:train
   c) teacher:classroom
   d) lawyer:courtroom

7) Choose the most appropriate word from the options to complete the sentence.
   Under ethical guidelines recently adopted by the Indian Medical Association, human genes are to be manipulated only to correct diseases for which (blank) treatments are unsatisfactory

a) similar b) most c) uncommon d) available

8) Choose the word that is nearly the opposite to the given word.
Frequency

a) periodicity b) rarity c) gradualness d) persistency

9) Three friends R, S and T shared from a bowl took $\frac{1}{3}^{rd}$ of the toffees, but returned four to the bowl. S took $\frac{1}{4}^{th}$ of what was left but returned three toffees to the bowl. T took half of the remainder but returned 2 back. If the had 17 toffees left, how many toffees were originally there in the bowl ?

a) 38 b) 31 c) 48 d) 41

10) The fuel consumed by a motorcycle during a journey while travelling at various speeds is indicated in the graph below.

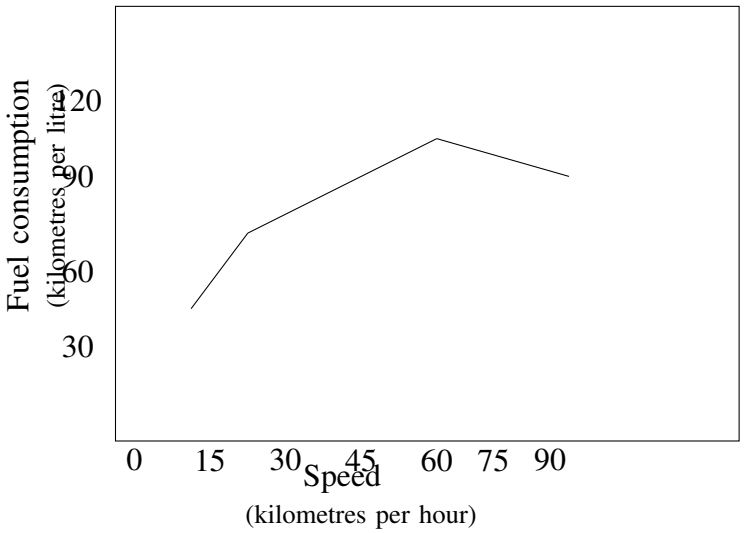

Fig. 10.

The distances covered during four laps o the journey are listed in the table below. From the given

LAP	**Distance** (kilometres)	**Average Speed** (kilometres per hour)
P	15	15
Q	75	45
R	40	75
S	10	10

data, we can conclude that the fuel consumed per kilometre was least during the lap

a) P b) Q c) R d) S

11) The horse has played a little known but very important role in the field of medicine. Horses were injected with toxins of diseases until their blood built p immunities. Then a serum was made from their blood. Serums to fight with diphtheria and tetanus were developed this way. It can be inferred from the passage that horses were

a) given immunity to diseases
b) generally quite immune to diseases
c) given medicines to fight toxins

d) given diphtheria and tetanus serums

12) The sum of n terms of the series 4 + 44 + 444 + … is

a) $\frac{4}{81}\left(10^{n+1}-9n-1\right)$
b) $\frac{4}{81}\left(10^{n-1}-9n-1\right)$
c) $\frac{4}{81}\left(10^{n+1}-9n-10\right)$
d) $\frac{4}{81}\left(10^{n}-9n-10\right)$

13) Given that $f(y)=\frac{|y|}{y}$ and q is any non-zero real number, the value of $|f(q)-f(-q|$ is

a) 0 b) -1 c) 1 d) 2