BYJU'S EXAM PREP

GATE 2021

Electrical Engineering

General Aptitude

Question Paper & Solutions

1. Which one of the following numbers is exactly divisible by $(11^{13} + 1)$?

   A. $11^{13} + 1$ B. $11^{26} + 1$

   C. $11^{39} - 1$ D. $11^{52} - 1$

   [2021 : 1 Mark]

Ans. A

Sol. Using Algebraic property,

$(11^{52} - 1) = (11^{26} + 1)(11^{26} - 1) = (11^{26} + 1)$

$(11^{13} - 1)(11^{13} + 1)$

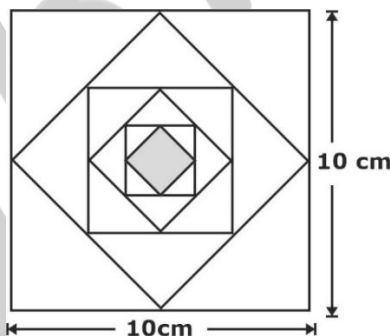Since $(11^{52} - 1)$ has factor of $(11^{13} + 1)$,

hence $(11^{52} - 1)$ is completely divisible by $(11^{13} + 1)$.

2. In the figure shown below, each inside square is formed by joining the midpoints of the slides of the next larger square. The area of the smallest square (shaded) as shown, in cm² is:

   A. 1.5625   B. 12.50

   C. 3.125   D. 6 .25

   [2021 : 2 Marks]

Ans. C

Sol.

Side of outer first square = 10 cm

Side of outer second square = 10/√2 cm

Side of outer third square = 10/(√2)² cm

Hence,

Side of smallest square   = 10/(√2)⁵ cm

Area of smallest square   = (side)²

$= [10/(√2)^5]^2$

$= 100/2^5 = 3.125$ cm²

3. Let X be a continuous random variable denoting the temperature measured. The range of temperature is [0, 100] degree Celsius and let the probability density function X be f(x) = 0.01 for 0 ≤ X ≤ 100. Then mean of X is _____.

A. 5 .0   B. 50.0

C. 2.5   D. 25.0

[2021 : 2 Marks]

Ans. B

Sol. PDF of X be f(x) = 0.01 for 0 ≤ x ≤ 100
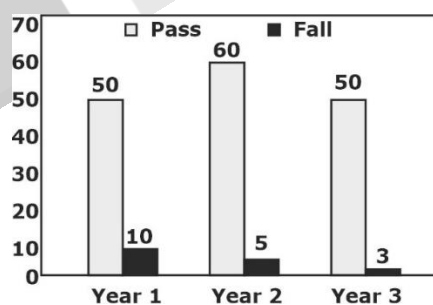
PDF f(x) = 0.01 for 0 ≤ x ≤ 100

$$E(x) = \int_0^{100} xf(x)\,dx = \int_0^{100} x(0.01)\,dx$$

$$= \frac{1}{100}\left[\frac{x^2}{2}\right]_0^{100}$$

$$= \frac{100}{2} = 50$$

4. The number of students passing or failing in an exam for a particular subject is presented in the bar chart above. Students who pass the exam cannot appear for the exam again. Students who fail the exam in the first attempt must appear for the exam in the following year. Students always pass the exam in their second attempt. The number of students who took the exam for the first time in the year 2 and the year 3 respectively, are _____.

A. 60 and 50   B. 55 and 48

C. 65 and 53   D. 55 and 53

[2021 : 2 Marks]

Ans. B

Sol. Total students in year 2 who have given exam = 60 + 5.

But 10 students who have passed in year 2 are those.

Which were failed in year 1.

Hence, students in year 2 appearing for first time = 65 – 10 = 55.

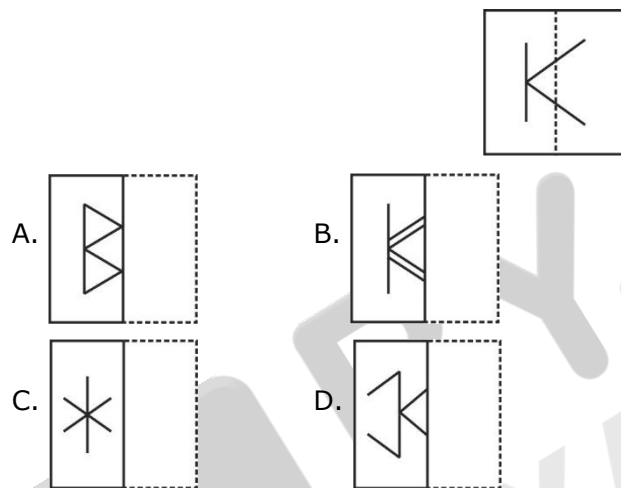Total students in year 3 who have given exam = 50 + 3 = 53.

But 5 students who have passed in year 2 are those which were failed in year 1.

Hence, students in year 3 appearing for time

= 53 – 5 = 48.

Hence, option B is correct.

5. A transparent square sheet shown above is folded along the dotted line. The folded sheet will look like _____.

[2021 : 1 Mark]

Ans. A

Sol. Since half of the paper fold. Hence the structure will look like two triangles on a vertical strip. Hence option A is correct.

6. For a regulator polygon having 10 sides, the interior angle between the sides of the polygon, in degrees, is:

A. 216   B. 396

C. 324   D. 144

[2021 : 1 Mark]

Ans. D

Sol. The interior angle between the sides of polygon $= \left(\dfrac{n-2}{n}\right) \times 180°$

where n = Number of sides
Hence interior angle is given as:

$$= \left(\frac{10-2}{10}\right) \times 180° = \left(\frac{8}{10}\right) \times 180° = 144°$$

7. Oasis is to sand as island is to _____. Which one of the following options maintains a similar logical relation in the above sentence?

A. Water　　　　B. Mountain

C. Stone　　　　D. Land

[2021 : 1 Mark]

Ans. A

Sol. Oasis is to sand as island is to Water.

So, Option A is correct.

8. Seven cars P, Q, R, S, T, U and V are parked in a row not necessarily in that order. The cars T and U should be parked next to each other. The cars S and V also should be parked next to each other, whereas P and Q cannot be parked next to each other. Q and S must be parked next to each other. R is parked to the immediate right of V. T is parked to the left of U. Based on the above statements. the only **INCORRECT** option given below is:

A. Car P is parked at the extreme end.

B. Q and R are not parked together.

C. There are two cars parked in between Q and V.

D. V is the only car parked in between S and R.

[2021 : 2 Marks]

Ans. C

Sol. From the given statement,

　⇒ Cars S and V are parked together.

　⇒ Cars Q and S are parked together.

　First ⇒ QSV

　Second ⇒ VSQ

　Now, R is parked immediate right of V.

　So, second arrangement is wrong as their S is parked at immediate right of V.

　Possible arrangement = QSVR

　As P and Q are not parked together and parked left to U.

　So, final arrangement is **PTUQSVR** or **PUTQSVR.**

　So, from the given options, option C is the only incorrect statement.

9. The people _____ were at the demonstration were from all sections of society.
   A. whom   B. which
   C. whose   D. who

[2021 : 1 Mark]

Ans. D

Sol. To refer to "people" which is plural we must use "who" and not "whom".
"whose" is used to refer to some object or property being associated with a person which is not applicable here.
"which" and "that" are the relative pronouns for animals and objects (not humans).
Hence, option D is correct.

10. The importance of sleep is often overlooked by students when they are preparing for exams. Research has consistently shown that sleep deprivation greatly reduces the ability to recall the material learnt. Hence. cutting down on sleep to study longer hours can be counterproductive. Which one of the following statements is the **CORRECT** inference from the above passage?
    A. Sleeping well alone is enough to prepare for an exam. Studying has lesser benefit.
    B. Students are efficient and are not wrong in thinking that sleep is a waste of time.
    C. To do well in an exam, adequate sleep must be part of the preparation.
    D. If a student is extremely well prepared for an exam, he needs little or no sleep.

[2021 : 2 Marks]

Ans. C

Sol. Option A: It is wrong as there is no information of benefits of studying an exam in given paragraph.

Option B: The paragraph does not give information about efficiency of student. Hence this option is also incorrect.

Option C: This option is correct as it explains about importance of sleep and adequate sleep is a part of preparation.

Option D: This option is incorrect as if a student is extremely well prepared for the exam, he needs little or no sleep, this information is not achieved from the given passage.