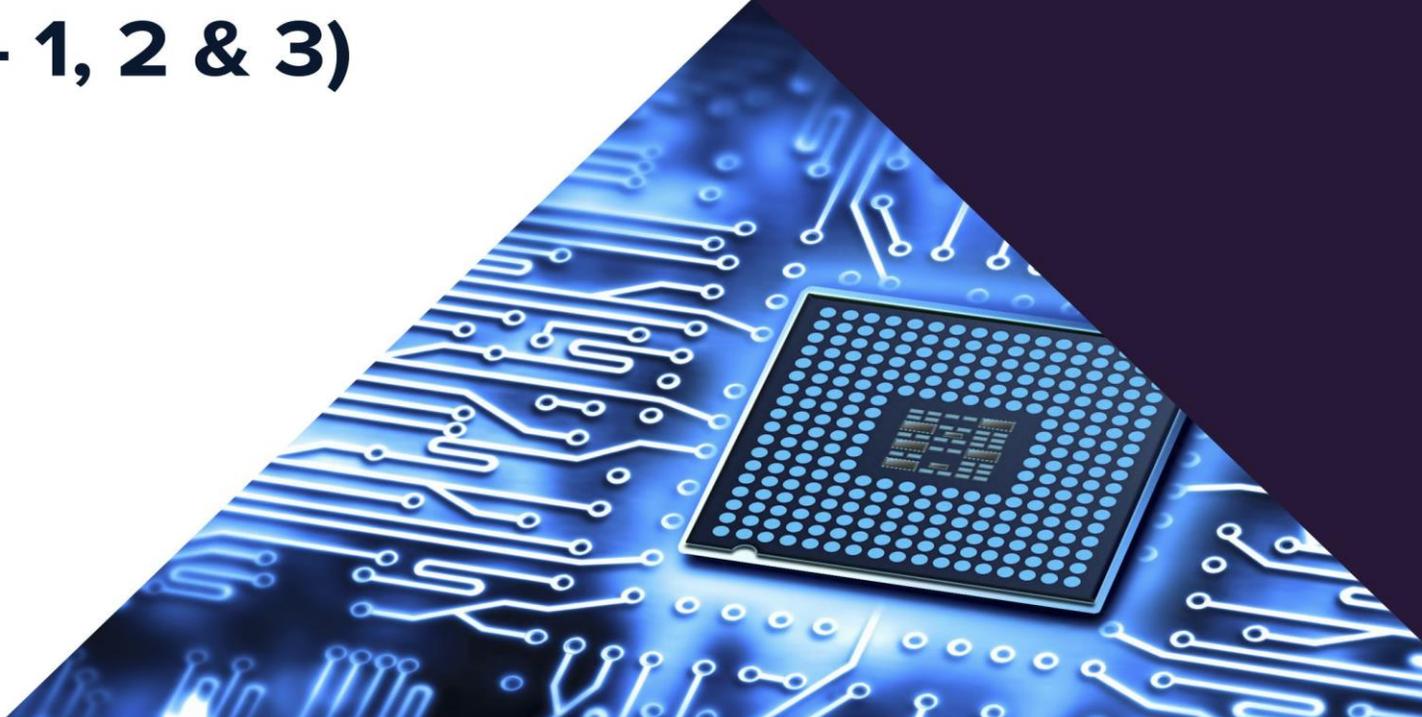


# GATE 2015

Electronics  
& Communication  
Engineering

► **General Aptitude  
Questions & Solutions  
(Set - 1, 2 & 3)**



### Set-1

1. Humpty Dumpty sits on a wall every day while having lunch. The wall sometimes breaks. A person sitting on the wall falls if the wall breaks.

Which one of the statements below is logically valid and can be inferred from the above sentences?

- A. Humpty Dumpty always falls while having lunch  
 B. Humpty Dumpty does not fall sometimes while having lunch  
 C. Humpty Dumpty never falls during dinner  
 D. When Humpty Dumpty does not sit on the wall, the wall does not break

**Ans.** B

**Sol.** According to the above given passage as wall sometimes breaks hence option B would be correct answer.

2. Choose the most appropriate word from the options given below to complete the following sentence. The principal presented the chief guest with a \_\_\_\_\_, as token of appreciation.
- A. momento                      B. memento  
 C. momentum                  D. moment

**Ans.** B

**Sol.** Here, the principal is presenting something to the chief guest as a token of appreciation, thus, the perfect fit for the blank will be some 'souvenir'. 'Moment' is completely illogical as it refers to a very brief period of time, also, 'momentum' refers to the impetus gained by a moving object that is irrelevant to the context. 'Momento' is a misspelled word for 'memento' that is related to remember or 'souvenir', hence, option B is the correct one.

3. Choose the word most similar in meaning to the given word:

**Educe**

- A. Exert                              B. Educate  
 C. Extract                          D. Extend

**Ans.** C

**Sol.** Educe means to bring out or develop. So according to that option C would be correct

4. If  $\log_x (5/7) = -1/3$ , then the value of x is
- A. 343/125                          B. 125/343  
 C. -25/49                              D. -49/25

**Ans.** A

**Sol.**  $\frac{5}{7} = x^{-1/3} \Rightarrow \frac{7}{5} = x^{1/3}$   
 $\Rightarrow x = \left(\frac{7}{5}\right)^3 = \frac{343}{125}$

5. Choose the appropriate word/phrase, out of the four options given below, to complete the following sentence: Frogs \_\_\_\_\_ .
- A. Croak                              B. Roar  
 C. Hiss                                  D. Patter

**Ans.** A

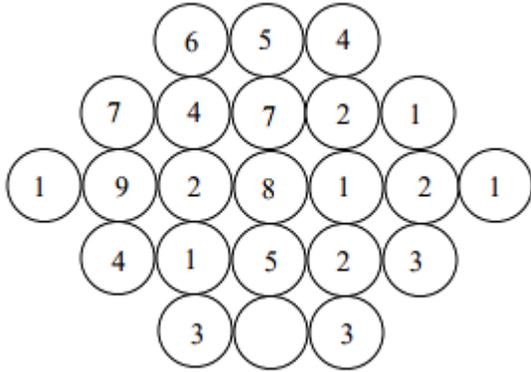
**Sol.** Frogs make 'croak' sound.

6. The following question presents a sentence, part of which is **bold**. Beneath the sentence you find four ways of phrasing the underline part. Following the requirements of the standard written English, select the answer that produces the most effective sentence. Tuberculosis, together with its effects, **ranks one of the leading causes of death** in India.
- A. ranks as one of the leading causes of death  
 B. rank as one of the leading causes of death  
 C. has the rank of one of the leading causes of death  
 D. are one of the leading causes of death

**Ans. A**

**Sol.** Following standard grammatical rules, only Option A would satisfy the above statement.

**7.** Fill in the missing value



**Ans.**

**Sol.** Middle number is the average of the numbers on both sides.

Average of 6 and 4 is 5

Average of (7+4) and (2+1) is 7

Average of (1+9+2) and (1+2+1) is 8

Average of (4+1) and (2+3) is 5

Therefore, Average of (3) and (3) is 3

**8.** Operators  $\square$ ,  $\diamond$  and  $\rightarrow$  are defined by:

$$a \square b = \frac{a-b}{a+b}; a \diamond b = \frac{a+b}{a-b}; a \rightarrow b = ab.$$

Find the value  $(66 \square 6) \rightarrow (66 \diamond 6)$ .

- A. -2                      B. -1  
C. 1                         D. 2

**Ans. C**

**Sol.**  $66 \square 6 = \frac{66-6}{66+6} = \frac{60}{72} = \frac{5}{6}$

$$66 \diamond 6 = \frac{66+6}{66-6} = \frac{72}{60} = \frac{6}{5}$$

$$(66 \square 6) \rightarrow (66 \diamond 6) = \frac{5}{6} \times \frac{6}{5} = 1$$

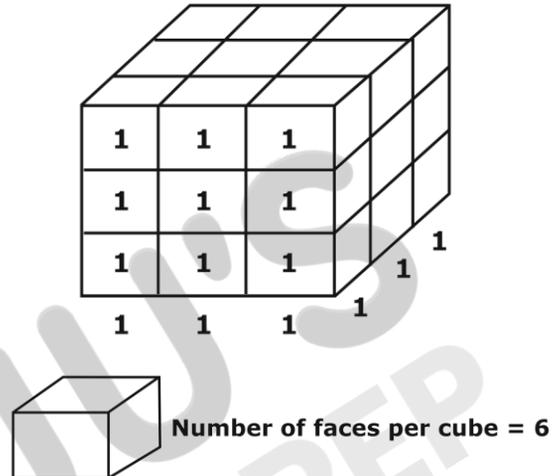
**9.** A cube of side 3 units is formed using a set of smaller cubes of side 1 unit. Find the proportion of the number of faces of the

smaller cubes visible to those which are NOT visible.

- A. 1 : 4                      B. 1 : 3  
C. 1 : 2                      D. 2 : 3

**Ans. C**

**Sol.**



Total number of cubes =  $9 \times 3 = 27$

$\therefore$  Total number of faces =  $27 \times 6 = 162$

$\therefore$  Total number of non-visible faces =  $162 - 54 = 108$

$$\therefore \frac{\text{Number of visible faces}}{\text{Number of non visible faces}} = \frac{54}{108} = \frac{1}{2}$$

**10.** Read the following paragraph and choose the correct statement. Climate change has reduced human security and threatened human wellbeing. An ignored reality of human progress is that human security largely depends upon environmental security. But on the contrary, human progress seems contradictory to environmental security. To keep up both at the required level is a challenge to be addressed by one and all. One of the ways to curb the climate change may be suitable scientific innovations, while the other may be the Gandhian perspective on small scale progress with focus on sustainability.

- A. Human progress and security are positively associated with environmental security.
- B. Human progress is contradictory to environmental security.
- C. Human security is contradictory to environmental security.
- D. Human progress depends upon environmental security.

**Ans.** B

**Sol.** After reading the above paragraph, only option B would be the correct answer.

### Set-2

- 11.** A tiger is 50 leaps of its own behind a deer. The tiger takes 5 leaps per minute to the deer's 4. If the tiger and the deer cover 8 meters and 5 meters per leap respectively. What distance in metres will be tiger have to run before it catches the deer?
- A. 568
  - B. 800
  - C. 400
  - D. 200

**Ans.** B

**Sol.** Correct answer is 800

One tiger leap = 8 m

So, Tiger Speed = 5 leap/min  
= 40 m/min

One deer leap = 5 m

So, Dear Speed = 4 leap/min = 20 m/min

After time t tiger catches the deer. Equating the distances, we obtain

Initial gap = 50 leap of time

= 50 × 8m = 400 m

or 400 m + 20t = 40 × t

$t = \frac{400}{20} = 20$  min

Hence, total distance = 400 + 20 × 20  
= 800 m

- 12.** Choose the appropriate word-phrase out of the four options given below, to complete the following sentence Dhoni, as well as the other team members of India team, \_\_\_\_\_ present on the occasion
- A. Were
  - B. Was
  - C. Has
  - D. Have

**Ans.** B

**Sol.** Words joined to a singular subject by WITH, AS WELL AS, takes a singular verb. So it will be WAS. "Dhoni, as well as the other team members of the Indian team", is treated like the singular subject in English grammar.

- 13.** If  $a^2 + b^2 + c^2 = 1$ , then  $ab + ac + bc$  lies in the interval
- A.  $[1, 2/3]$
  - B.  $[-1/2, 1]$
  - C.  $[-1, 1/2]$
  - D.  $[2, -4]$

**Ans.** B

**Sol.** The correct option is B.

We know  $(a + b + c)^2 = a^2 + b^2 + c^2 + 2(ab + bc + ca)$

Given  $a^2 + b^2 + c^2 = 1$

So,  $(a + b + c)^2 = 1 + 2(ab + bc + ca)$

$(a+b+c)^2 \geq 0$  for any real a,b,c

$ab + bc + ca \geq -1/2$

Since, A.M.  $\geq$  G.M.

$\Rightarrow (a+b)/2 \geq \sqrt{ab}$

$\Rightarrow a+b \geq 2\sqrt{ab}$

Assume  $a=a^2$  and  $b=b^2$

$\Rightarrow a^2+b^2 \geq 2ab$  -----(1)

similarly,

$b^2+c^2 \geq 2bc$  -----(2)

$c^2+a^2 \geq 2ac$  -----(3)

adding (1), (2) and (3) we get

$a^2+b^2+c^2 \geq ab+bc+ca$

Since,  $a^2+b^2+c^2=1$

$(ab+bc+ca) \leq 1$

Therefore,  $ab+bc+ca$  lies in the interval  $[-1/2,1]$

**14.** What is the adverb for the given word below?

Misogynous

- A. Misogynousness      B. Misogynity  
C. Misogynously      D. Misogynous

**Ans.** C

**Sol.** Misogynous is the hatred or dislike of women or girls.

Adverb: Misogynously.

**15.** In the following sentence certain parts are underlined and marked P, Q and R. One of the parts may contain certain error or may not be acceptable in standard written communication. Select the part containing an error. Choose D as your answer if there is no error.

The student corrected all the errors (P) that the instructor marked (Q) on the answer book (R)

- A. P                                      B. Q  
C. R                                      D. No error

**Ans.** B

**Sol.** In Q part, 'the' is not required.

**16.** Lamenting the gradual sidelining of the arts in school curricula, a group of prominent artist wrote to the Chief Minister last year, asking him to allocate more funds to support arts education in schools. However, no such increases have been announced in this year's Budget. The artists expressed their deep anguish at their request not being approved, but many of them remain optimistic about funding in the future. Which of the statement (s) below is/are logically valid and can be inferred from the above statements?  
(i) The artists expected funding for the arts to increase this year

(ii) The Chief Minister was receptive to the idea of increasing funding of the arts

(iii) The Chief Minister is a prominent artist

(iv) Schools are giving less importance to arts education nowadays

- A. (iii) and (iv)                      B. (i) and (iv)  
C. (i), (ii) and (iv)                D. (i) and (iii)

**Ans.** B

**Sol.** The artists asked Chief Minister to allocate more funds to support arts education in schools but schools are giving less importance to arts education nowadays

**17.** Given below are two statements followed by two conclusions. Assuming these statements to be true, decide which one logically follows.

**Statements:**

- I. All film stars are playback singers  
II. All film directors are film stars

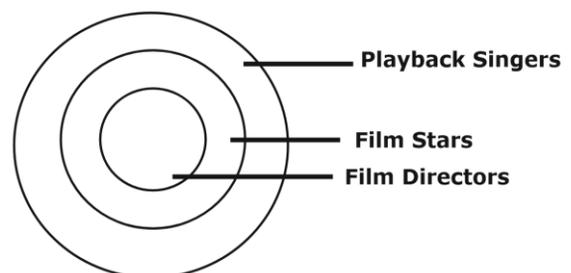
**Conclusions:**

- I. All film directors are playback singers.  
II. Some film stars film directors.

- A. Only conclusion I follow  
B. Only conclusion II follows  
C. Neither conclusion I nor II follows  
D. Both conclusions I and II follows

**Ans.** D

**Sol.** Both conclusions I and II follows



I. All film directors are playback singers ----- correct.

II. Some film stars film directors ----- correct.

**18.** Choose the word most similar in meaning to the given word:

**Awkward**

- A. Inept
- B. Graceful
- C. Suitable
- D. Dredfull

**Ans.** A

**Sol.** Inept is the word whose meaning is similar to Awkward.

**19.** An electric bus has onboard instruments that report the total electricity consumed since the start of the trip as well as the total distance covered. During a single day of operation, the bust travels on stretches M, N, O and P, in that order. The cumulative distances traveled and the corresponding electricity consumption are shown in the Table below

Stretch	Cumulative distance (km)	Electricity used (kWh)
M	20	12
N	45	25
O	75	45
P	100	57

The stretch where the electricity consumption per km is minimum is

- A. M
- B. N
- C. O
- D. P

**Ans.** D

**Sol.**

Stretch	Cumulative distance (km)	Electricity used (kWh)	Individual Distance (km)	Individual Electricity (kWH)
M	20	12	20	12
N	45	25	25	13
O	75	45	30	20
P	100	57	25	12

For

M,  $12/20 = 0.6$

N,  $13/25 = 0.52$

O,  $20/30 = 0.667$

P,  $12/25 = 0.48$ .

**20.** Ram and Ramesh appeared in an interview for two vacancies in the same department. The probability of Ram's selection is  $1/6$  and that of Ramesh is  $1/8$ . What is the probability that only one of them will be selected?

- A.  $47/48$
- B.  $1/4$
- C.  $13/48$
- D.  $35/48$

**Ans.** B

**Sol.**  $P(\text{Ram}) = 1/6$ ,  $P(\text{Ramesh}) = 1/8$   
 $P(\text{only one}) = P(\text{Ram}) \times P(\text{not Ramesh}) + P(\text{not Ram}) \times P(\text{Ramesh})$   
 $= 1/6 \times 7/8 + 5/6 \times 1/8 = 12/48 = 1/4$

**Set-3**

**21.** Choose the correct verb to fill in the blank below:

Let us \_\_\_\_\_.

- A. Introvert
- B. alternate
- C. atheist
- D. altruist

**Ans.** B

**Sol.** Only 'alternate' is verb while all other are noun.

**22.** Ms. X will be in Bagdogra from 01/05/2014 to 20/05/2014 and from 22/05/2014 to 31/05/2014. On the morning of 21/05/2014, she will reach Kochi via Mumbai. Which one of the statements below is logically valid and can be inferred from the above sentences?

- A. Ms. X will be in Kochi for one day, only in May
- B. Ms. X will be in Kochi for only one day in May
- C. Ms. X will be only in Kochi for one day in May
- D. Only Ms. X will be in Kochi for one day in May.

**Ans.** B

**Sol.** Second sentence says that Ms. X reaches Kochi on 21/05/2014. Also she has to be in Bagdogora on 22/05/2014.

Therefore, She stays in Kochi for only one day in may.

**23.**  $\log \tan 1^\circ + \log \tan 2^\circ + \dots + \log \tan 89^\circ$  is

- \_\_\_\_\_
- A. 1                                      B.  $1/\sqrt{2}$   
 C. 0                                        D. -1

**Ans.** C

**Sol.** As per trigonometric properties

$\tan \theta = \cot (90-\theta)$  and  $\tan \theta \cdot \cot \theta = 1$

thus,  $\tan 89^\circ = \cot (90-89^\circ) = \cot 1^\circ$

Similarly,  $\tan 88^\circ = \cot 2^\circ$ ,  $\tan 87^\circ = \cot 3^\circ$ , ans so on...

also, from Log properties

$\log m + \log n = \log (mn)$

thus,  $\log \tan 1^\circ + \log \tan 89^\circ = \log (\tan 1^\circ \times \tan 89^\circ)$

$= \log (\tan 1^\circ \times \cot 1^\circ) = \log 1$

$= 0$

similarly,  $\log \tan 2^\circ + \log \tan 88^\circ = \log (\tan 2^\circ \times \cot 2^\circ) = \log 1 = 0$

thus,  $\log \tan 1^\circ + \log \tan 2^\circ + \dots + \log \tan 89^\circ = 0$ .

**24.** Choose the most suitable one word substitute for the following expression:

Connotation of a road or way:

- A. Pertinacious                      B. Viaticum  
 C. Clandestine                        D. Ravenous

**Ans.** B

**Sol.** Viaticum is the most relevant word.

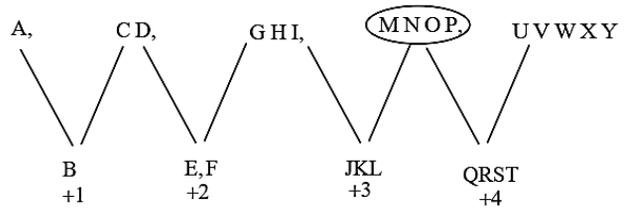
**25.** Find the missing sequence in the letter series below:

A, CD, GHI,?, UVWXY

- A. LMN                                      B. MNO  
 C. MNOP                                    D. NOPQ

**Ans.** C

**Sol.**



**26.** In the following question, the first and the last sentence of the passage are in order and numbered 1 and 6. The rest of the passage is split into 4 parts and numbered as 2,3,4, and 5. These 4 parts are not arranged in proper order. Read the sentences and arrange them in a logical sequence to make a passage and choose the correct sequence from the given options.

- 1) On Diwali, the family rises early in the morning.
- 2) The whole family, including the young and the old enjoy doing this,
- 3) Children let off fireworks later in the night with their friends.
- 4) At sunset, the lamps are lit and the family performs various rituals
- 5) Father, mother, and children visit relatives and exchange gifts and sweets.
- 6) Houses look so pretty with lighted lamps all around.

- A. 2, 5, 3, 4                                      B. 5, 2, 4, 3  
 C. 3, 5, 4,2                                      D. 4, 5, 2, 3

**Ans.** B

**Sol.** Statement 2 is about activities enjoyed by the family whereas statement 5 gives information about the activities by the family. Therefore, statement 2 follows statement 5. i.e., (5<2)

Statement 3 is about the activities at night whereas statement 4 talks about activities in the evening.

Therefore, statement 3 follows statement 4. i.e., (4<3.) and 4 cannot be the first event (evident from the word 'sunset') and hence option 4 gets eliminated.

Also, statement 3 must be the last part (evident from the word 'night') among the others (2, 3, 4, 5) Thus, options 2 and 3 get eliminated.

Thus, considering the timeline of events, the best possible logical sequence is 5, 2, 4, 3. Hence '5, 2, 4, 3' is the correct answer.

**27.** If  $x > y > 1$ , which of the following must be true?

- (i)  $\ln x > \ln y$
- (ii)  $e^x > e^y$
- (iii)  $y^x > x^y$
- (iv)  $\cos x > \cos y$

- A. (i) and (ii)
- B. (i) and (iii)
- C. (iii) and (iv)
- D. (ii) and (iv)

**Ans.** A

**Sol.** For whole numbers, greater the value greater will be its log.

Same logic for power of e.

**28.** Ram and Shyam shared a secret and promised to each other that it would remain between them. Ram expressed himself in one of the following ways as given in the choices below.

Identify the correct way as per standard English.

- A. It would remain between you and me.
- B. It would remain between I and you

- C. It would remain between you and I
- D. It would remain with me.

**Ans.** A

**Sol.** 'between you and me' is correct according to standard English.

**29.** From a circular sheet of paper of radius 30cm, a sector of 10% area is removed. If the remaining part is used to make a conical surface, then the ratio of the radius and height of the cone is \_\_\_\_\_.

**Ans.**

**Sol.** 90% of area of sheet = Cross sectional area of cone

$$\Rightarrow 0.9 \times \pi \times 30 \times 30 = \pi \times r_1 \times 30$$

$$\Rightarrow 27 \text{ cm} = r_1$$

$$\therefore \text{height of the cone} = \sqrt{30^2 - 27^2}$$

$$= 13.08 \text{ cm}$$

$$\frac{r}{h} = \frac{27}{13.08} = 2.06$$

**30.** Choose the most appropriate word from the options given below to complete the following sentence?

If the athlete had wanted to come first in the race, he \_\_\_\_\_ several hours every day.

- A. Should practice
- B. Should have practised
- C. Practised
- D. Should be practicing

**Ans.** B

**Sol.** For condition regarding something which already happened, "should have practiced" is the correct choice.

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