



# GURUKUL CLASSES

## IIT, NEET & FOUNDATION DIVISION

**SAMPLE**

**GAT-2017 (10th)**

**GC-D-JEE-MAIN-2016 (10th)**

Time: - 2 Hours

Date :

Question Paper Format

1. The question paper consists of 4 parts (physics, mathematics, chemistry & mental ability). First Three parts have six sections. 4<sup>th</sup> Part Contains 15 Questions (+3-1)
2. **Section – I** contains 3 multiple choice questions. Each question has 4 choices (A), (B), (C) & (D) for its answer, out of which only one is correct (+3 -1).
3. **Section – II** contains 3 multiple choice questions. Each question has 4 choices (A), (B), (C) & (D) for its answer, out of which one or more is/are correct (+4 -0).
4. **Section – III** contains 1 Passage. Based upon passage, 3 multiple choice questions. Each question has 4 choices (A), (B), (C) & (D) for its answer, out of which only one is correct (+5 -2).
5. **Section – IV** contains 3 Assertion-Reason Question. Each question has 4 choices (A), (B), (C) & (D) for its answer, out of which only one is correct (+3 -1).
6. **Section – V** contains 2 questions are Integer answer type, 0 to 9.(+4 -1)
7. **Section – VI** contains 2 questions. Each question has four statement (A, B, C & D) given in column I and Four statement (P, Q, R & S) in column II. Any given statement in Column I can have correct matching with one or more statement(s) given in column II. For example, if for a given question, statement. B matches with the statements given in Q and R, then for that particular question, against. Statement B, darken the bubbles corresponding to Q and R in the ORS.(+8 -0)

### Useful Data

**Atomic No:** H = 1, D = 1, Li = 3, Na = 11, K = 19, Rb = 37, Cs = 55, F = 9, Ca = 20, He = 2, O = 8, Au = 79, Ni = 28, Zn = 30, Cu = 29, Cl = 17, Br = 35, Cr = 24, Mn = 25, Fe = 26, S = 16, P = 15, C = 6, N = 7, Ag = 47.

**Atomic Masses:** He = 4, Mg = 24, C = 12, O = 16, N = 14, P = 31, Br = 80, Cu = 63.5, Fe = 56, Mn = 55, Pb = 207, Au = 197, Ag = 108, F = 19, H = 1, Cl = 35.5, Sn = 118.6, Na = 23, D = 2, Cr = 52, K = 39, Ca = 40, Li = 7, Be = 4, Al = 27, S = 32.

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**SAMPLE PAPER**

**GATE-2017 (10th)**



## Useful Data

**Atomic No:** H = 1, D = 1, Li = 3, Na = 11, K = 19, Rb = 37, Cs = 55, F = 9, Ca = 20, He = 2, O = 8, Au = 79, Ni = 28, Zn = 30, Cu = 29, Cl = 17, Br = 35, Cr = 24, Mn = 25, Fe = 26, S = 16, P = 15, C = 6, N = 7, Ag = 47.  
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SECTION - I

Straight Objective Type ONLY ONE is Correct

(+ 3 – 1)

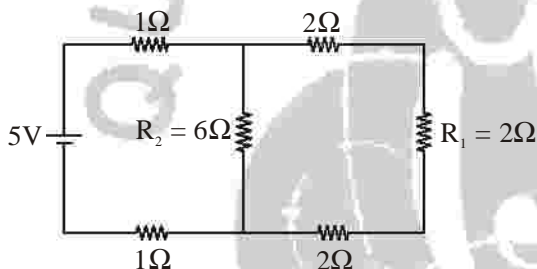
- What is the magnitude of charge of an electron?  
 a)  $0.6 \times 10^{-19}$  coulomb    b)  $1.6 \times 10^{-19}$  coulomb    c)  $2.6 \times 10^{-19}$  coulomb    d) Zero
- If angle of incidence of a ray of light on surface of medium is  $60^\circ$  and angle of refraction is  $30^\circ$  then what is the value of refractive index of that medium.  
 a)  $\frac{1}{\sqrt{3}}$     b)  $\frac{2}{\sqrt{3}}$     c)  $\sqrt{3}$     d) 3
- An electric Bulb of power rating 100 W, 220 V is used 15 hrs per day. Calculate the units of energy consumed by the bulb in 10 days.  
 a) 1.5 units    b) 25 units    c) 15 units    d) 2.5 units
- The distance travelled by a sound wave having frequency 1000 Hz & wavelength 0.25 m, when it travels for 10 s in a certain medium is  
 a) 2500 m    b) 1250 m    c) 3000 m    d) 2000 m

SECTION - II

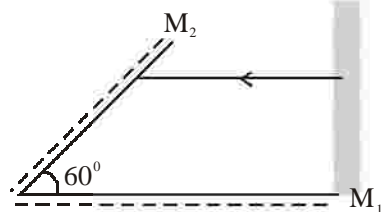
Multiple Correct Answer Type (ONLY or MORE is/are Correct)

(+ 4 – 0)

5.



- Net resistance of given circuit is  $5 \Omega$
  - Net current drawn from battery = 1 A
  - Current flowing through resistor  $R_1$  is 0.5 A.
  - Current flowing through resistor  $R_2$  is 0.25 A
- 6.



The given incident ray as shown in diagram is parallel to mirror  $M_1$ .

- Angle of reflection at mirror  $M_2$  is  $30^\circ$
- Angle of reflection at mirror  $M_2$  is  $60^\circ$
- Angle of reflection at mirror  $M_1$  is  $30^\circ$
- Angle of reflection at mirror  $M_1$  is  $60^\circ$

**PASSAGE**

Gravitational force of attraction between two bodies of masses  $m_1, m_2$  separated by a distance 'r' is given by the formula  $F = G \frac{m_1 m_2}{r^2}$  where, G is universal gravitational constant having magnitude  $6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$ . 'g' in gravitation is used to indicate acceleration due to gravity for various planets. This 'g' is not a constant and varies with different parameters.

for moon, mass of moon =  $7.4 \times 10^{22} \text{ kg}$

Radius of moon = 1740 km

7. If the weight of a book on moon is 90 N, then the weight of that same book on a hypothetical planet having mass twice as that of moon and radius thrice as that of moon will be  
 a) 20 N                      b) 40 N                      c) 10 N                      d) 50 N
8. The value of acceleration due to gravity on the surface of moon will be  
 a)  $9.8 \text{ m/s}^2$                       b)  $1.63 \text{ m/s}^2$                       c)  $4.9 \text{ m/s}^2$                       d) data insufficient
9. Acceleration due to gravity on the surface varies with radius as  
 a)  $g \propto R^{-1}$                       b)  $g \propto R^1$                       c)  $g \propto R^{-2}$                       d)  $g \propto R^2$

**SECTION - VI****Matching Type****(+ 8 – 0)****10. MATCH THE COLUMN****Column I**

- A. S.I. unit of electric field  
 B. S.I. unit of current  
 C. S.I. Unit of refractive index  
 D. C.G.S. unit of charge

**Column II**

- P. ampere  
 Q. Volt/meter  
 R. Stat coulomb  
 S. no unit

Ans key Q.no.10

A-Q;  
 B-P;  
 C-S;  
 D-R

**PART- B (MATHEMATICS)****SECTION - I****Straight Objective Type ONLY ONE is Correct****(+ 3 – 1)**

11. The diagonal of a square is  $8\sqrt{2}$  cm. The length of a rectangle is 16 cm. If the square and rectangle have the same area, then width of the rectangle is  
 a) 1 cm                      b) 2cm                      c) 3 cm                      d) 4cm
12. Maximum and minimum values of  $\sin^4 q + \cos^4 q$  are  
 (a) 0, 2                      (b)  $1, \frac{1}{2}$                       (c) -1, 1                      (d) none of these
13. If  $\tan 35^\circ = k$ , then the value of  $\frac{\tan 145^\circ - \tan 125^\circ}{1 + \tan 145^\circ \tan 125^\circ} =$   
 a)  $\frac{2k}{1-k^2}$                       b)  $\frac{2k}{1+k^2}$                       c)  $\frac{1-k^2}{2k}$                       d)  $\frac{1-k^2}{1+k^2}$
14. If  $\tan q = 2$ , then  $5 \cos^2 q$  equals  
 a) 1                      b) 2                      c) 3                      d) 4

**SECTION - II****Multiple Correct Answer Type (ONLY or MORE is/are Correct)****(+ 4 – 0)**

15. If  $\sec q + \tan q = 2$ , then  
 a)  $4 \tan \theta = 3$                       b)  $5 \sin \theta = 3$                       c)  $5 \cos \theta = 4$                       d)  $5 \sec \theta = 4$
16.  $\sin^6 q + \cos^6 q + 3 \sin^2 q \cos^2 q$  is equal to  
 a)  $\cos 0^\circ$                       b)  $\sin 90^\circ$                       c)  $\tan 45^\circ$                       d)  $\sin 60^\circ$

**PASSAGE**

If  $15x^2 + 31x + 14 = (Ax + B)(Cx + D)$  where A, B, C, D are natural numbers such that  $B < A < C < D$

17. **A + B is equal to**  
 a) 4C                                      b) 3C                                      c) 2C                                      d) C
18. **C + D is equal to**  
 a) 4A                                      b) 3A                                      c) 2A                                      d) A
19. **D - C is equal to**  
 a) 2B                                      b) B                                      c) 3B                                      d) 4B

**SECTION - VI****Matching Type****(+ 8 - 0)**

20. **Find the rank of the following word & match the column**

Ans key Q.no.20

- A) MOTHER                                      P) 92  
 B) EARTH                                      Q) 100  
 C) SCHOOL                                      R) 309  
 D) PREMI                                      S) 303

A-R;  
B-Q;  
C-S;  
D-P**PART-C (CHEMISTRY)****SECTION - I****Straight Objective Type ONLY ONE is Correct****(+ 3 - 1)**

21. **How many molecules are present in three moles of ethane**  
 a)  $11 \times 6.022 \times 10^{23}$                       b) 3                                      c)  $3 \times 6.022 \times 10^{23}$                       d)  $3 \times 8 \times 6.022 \times 10^{23}$
22. **Formula for aluminate is**  
 a)  $AlO_3^{3-}$                                       b)  $AlO_3^{4-}$                                       c)  $AlO_2^{3-}$                                       d)  $AlO_2^{4-}$
23. **Which one of the following used as fire extinguisher?**  
 a) Sodium carbonate                      b) Potassium carbonate                      c) Calcium carbonate                      d) Magnesium carbonate
24. **Study the following equations & Mark the correct option**  
 $2A + 2B \rightleftharpoons 2AOH + H_2$   
 $S + O_2 \rightleftharpoons C$   
 $C + B \rightleftharpoons D$
- |    | A  | B                | C               | D                              |
|----|----|------------------|-----------------|--------------------------------|
| a) | Na | H <sub>2</sub> O | SO <sub>2</sub> | H <sub>2</sub> SO <sub>3</sub> |
| b) | Na | H <sub>2</sub> O | SO <sub>2</sub> | H <sub>2</sub> SO <sub>4</sub> |
| c) | K  | H <sub>2</sub> O | SO <sub>2</sub> | H <sub>2</sub> SO <sub>4</sub> |
| d) | K  | H <sub>2</sub> O | SO <sub>3</sub> | H <sub>2</sub> SO <sub>3</sub> |

**SECTION - II****Multiple Correct Answer Type (ONLY or MORE is/are Correct)****(+ 4 - 0)**

25. **Synthetic fibres are**  
 a) Cheap                                      b) Soaks less water  
 c) They are not attacked by microorganism                      d) They are weak & weighted.
26. **Green house gases are**  
 a) Nitrous oxide                      b) Carbon dioxide                      c) Oxygen                      d) CNG

**SECTION - III****Linked Comprehension Type****(+ 5 - 2)****PASSAGE**

Green house effect is a phenomenon. The impact of green house effect is Global warming and climate change. Our earth receives energy from the sun. The earth surface absorbs the solar energy and releases it back to the atmosphere as infrared radiation, some of which goes right back into space. But some of the infrared radiation emitted by the earth is absorbed by CO<sub>2</sub>, CH<sub>4</sub> and water vapours in the atmosphere and sent back towards the earth surface as heat energy causing a warming known as Green House effect. The gases that contribute to the green house effect are called as green house gases. The warming due to greenhouse gases is expected to increase as humans add more green house gases to the atmosphere leading to global warming. The following table shows time during which green house gases remain in the atmosphere

Carbon Dioxide	CO <sub>2</sub>	Upto 100 years
Methane	CH <sub>4</sub>	12 years
Nitrous Oxide	N <sub>2</sub> O	114 years
CFC-12	CCl <sub>2</sub> F <sub>2</sub>	100 Years

27. **Green house effect leads to**  
 a) Global warming      b) Climate change      c) (a) & (b) both      d) Flooding
28. **Which is as group of green house gases**  
 a) CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, CCl<sub>2</sub>F<sub>2</sub>      b) SO<sub>2</sub>, O<sub>2</sub>, CO, CO<sub>2</sub>      c) CH<sub>4</sub>, N<sub>2</sub>, H<sub>2</sub>      d) None of these
29. **Infra red radiation are trapped by**  
 a) CO<sub>2</sub>, CH<sub>4</sub>, etc      b) O<sub>2</sub>      c) H<sub>2</sub>      d) N<sub>2</sub>

**SECTION - VI**

**Matching Type**

**30. MATCH THE COLUMN**

Ans key Q.no.30  
 A-R;  
 B-S;  
 C-P;  
 D-Q

**Column I**

1. Cassiterite
2. Chalcopyrite
3. Dolomite
4. Cinnabar

**Column II**

- P. Mg
- Q. Hg
- R. Sn
- S. Cu

**PART- D (BIOLOGY)**

**SECTION - I**

**Straight Objective Type ONLY ONE is Correct**

**(+ 3 – 1)**

31. **The digested food is absorbed by \_\_\_\_\_ in the intestine**  
 a) Villi      b) rugal      c) Lacteal      d) Pancreas
32. **Largest organ of the body is**  
 a) Skin      b) Liver      c) Kidney      d) Brain
33. **Loss of water from areal part of plant is called as \_\_\_\_\_**  
 a) Guttation      b) transpiration      c) Photosynthesis      d) Osmosis
34. **Gametes are**  
 a) Haploid (n)      b) deploid (2n)      c) triploid (3n)      d) tetraploid (4n)

**SECTION - II**

**Multiple Correct Answer Type (ONLY or MORE is/are Correct)**

**(+ 4 – 0)**

35. **Male part of a typical flower is**  
 a) Anther      b) Filament      c) Stigma      d) Style
36. **Number of chromosomes present in somatic cell of a human is (Somatic ® normal body cells)**  
 a) 46 pairs      b) 23 pairs      c) 98      d) 48

**SECTION - III**

**Linked Comprehension Type**

**(+ 5 – 2)**

**PASSAGE**

X is thread from which y is made. If y is of natural origin it is called Z fibres and if it is prepared by man it is called as W fibres. Nylon, rayon, polyster etc. examples of W.

37. **What is X**  
 a) wool      b) fibre      c) suit      d) socks
38. **What is y**  
 a) paper      b) chair      c) Book      d) cloth
39. **What is Z**  
 a) Animal fibre      b) Natural fibre      c) Elastic fibre      d) Synthetic fibre

**SECTION - VI**

**Matching Type**

**(+ 8 – 0)**

**40. MATCH THE COLUMN**

Ans key Q.no.40  
 A-P;  
 B-S;  
 C-Q;  
 D-R

**Column I**

- A. Sperm
- B. Ova/egg
- C. Tall
- D. DNA

**Column II**

- P. Testis
- Q. dominant character
- R. deoxy ribonucleic acid
- S. ovary

- 41. Which number would replace question mark in the series ? 81, 100, 121, 144, 169, ?**
- a) 225                                      b) 215                                      c) 200                                      d) 196
- 42. Sorrow : Death : Happiness : ?**
- a) Love                                      b) Dance                                      c) Cry                                      d) Birth
- Q. 43 to 46**
- Savita, Kavita, Namita, Amita and Asmita had attended \_\_\_\_\_ by wearing sarees of different colours. These colours were violet, blue, saffron, red and green. From the following information identify the exact colour of the saree worn by girls.
- A) The colour of Savita’s saree was neither saffron nor green.  
 B) Amita has wearing either blue or violet saree.  
 C) The colour of saree which Kavita has worn was not green or red.  
 D) Namita had worn a saree having either green or blue colour.  
 E) Asmita had worn violet coloured saree.
- 43. What was the colour of saree worn by Savita?**
- a) Green                                      b) Blue                                      c) Saffron                                      d) Red
- 44. Who had worn saffron coloured saree?**
- a) Kavita                                      b) Namita                                      c) Savita                                      d) Asmita
- 45. Which coloured saree did Amita wear?**
- a) Saffron                                      b) Violet                                      c) Blue                                      d) Green
- 46. Who had worn green coloured saree?**
- a) Savita                                      b) Namita                                      c) Kavita                                      d) Asmita
- 47. In a certain code language, COMPUTER is written as RFUVQNPC, how is MEDICINE written in that code?**
- a) EOJDJEFM                                      b) EOJDEJFM                                      c) MFEJDJOE                                      d) MFEDJJOE
- 48. 21921 :: 101327 :: 625945 :: ?**
- a) 705350                                      b) 625964                                      c) 705351                                      d) 525369
- 49. If 2nd October falls on Monday, then what was the day 10th July 1998?**
- a) Monday                                      b) Sunday                                      c) Saturday                                      d) Friday
- 50. The clock shows the correct time as 45 minutes past 5 hours, then find the angle between hour hand and minute hand?**
- a) 120°                                      b) 142.5°                                      c) 97.5°                                      d) 100°