

## GATE QUESTION PAPER PATTERN

*Each paper contains 65 questions carrying 100 marks*

**Question Papers bearing the codes : AE, AG, AR, BT, CE, CH, CS, CY, EC, EE, IN, MA, ME, MN, MT, PH, PI and TF**

Paper Code	Patterns of Question papers	Negative Marks for wrong Answer
AE, AG, AR, BT, CE, CH, CS, CY, EC, EE, IN, MA, ME, MN, MT, PH, PI, TF	Q.1 to Q.25: <i>Will carry one mark each</i> (sub-total 25 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.26 to Q.55: <i>Will carry two marks each</i> (sub-total 60 marks)	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	Q.48 through Q.51 (2 pairs) will be <u>common data questions</u> . <i>Each question will carry two marks</i>	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	Question pairs (Q.52, Q.53) and (Q.54, Q.55) will be <b>linked answer questions</b> . The answer to the second question of the last two pairs will depend on the answer to the first question of the pair. If the first question in the linked pair is wrongly answered or is un-attempted, then the answer to the second question in the pair will not be evaluated. <i>Each question will carry two marks</i>	There will be negative marks only for wrong answer to the first question of the linked answer question pair i.e. for Q.52 and Q.54, $\frac{2}{3}$ mark will be deducted for each wrong answer. There is no negative marking for Q.53 and Q.55.
	Q.56 to Q.60 : From General Aptitude (GA) <i>will carry one mark each</i> (sub-total 5 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.61 to Q.65 : From GA <i>will carry two marks each</i> (sub-total 10 marks)	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	All the papers bearing the codes AE, AG, BT, CE, CH, CS, EC, EE, IN, ME, MN, MT, PI and TF will contain few questions on Engineering Mathematics carrying 15 marks.	

**GG Paper : (Geology & Geophysics) Paper**

PART A	Part A common for all candidates	
	(Q.1 to Q.25) carrying <i>one mark each</i> (sub-total 25 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
Sections 1 & 2 in PART B	Part B will contain two sections :Section 1 (Geology) and Section 2 (Geophysics). Candidates will have to attempt questions either Section 1 or Section 2.	
	In this section, Q.26 to Q.55 (30 questions) <i>will carry two marks each</i> (sub-total 60 marks).	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	Q.48 to Q.51 (2 pairs) will be <b>common data questions</b> . <i>Each question will carry two marks.</i>	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	Question pairs (Q.52, Q.53) and (Q.54, Q.55) will be <b>linked answer questions</b> . The answer to the second question in these two pairs will depend on the answer to the first question of the pair. If the first question in the linked pair is wrongly answered or is un-attempted, then the answer to the second question in the pair will not be evaluated	There will be negative marks only for wrong answer to the first question of the linked answer question pair i.e. for Q.52 and Q.54, $\frac{2}{3}$ mark will be deducted for each wrong answer. There is no negative marking for Q.53 and Q.55.
General Aptitude (GA)	Q.56 to Q.60: <i>Will carry one mark each</i> (sub-total 5 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.61 to Q.65: <i>Will carry two marks each</i> (sub-total 10 marks)	$\frac{2}{3}$ mark will be deducted for each wrong answer.

**XE Paper - Section A (Engineering Mathematics)**

Section A in XE paper	There will be 11 questions carrying 15 marks in XE Section A (Engineering Mathematics) paper	
	Q.1 to Q.7 (4 questions) will carry one mark each (sub-total 7 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.8 to Q.11 (4 questions) will carry two marks each (sub-total 8 marks)	$\frac{2}{3}$ mark will be deducted for each wrong answer.

**XE section papers (Sections B through G) will contain 22 questions carrying 35 marks**

Sections B, C, D, E, F & G in XE papers	Q.1 to Q.9 (9 questions) <i>will carry one mark each</i> (sub-total 9 marks)	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.10 to Q.22 (13 questions) <i>will carry two marks each</i> (sub-total 26 marks).	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	Q.17 through Q.20 (2 pairs) will be <b>common data based questions</b> . <i>Each will carry two marks</i>	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	Q.21, Q.22 will be <b>linked answer questions</b> The answer to the second question of the pair of linked question will depend on the answer to the first question of the pair. If the first question in the linked pair is wrongly answered or is un-attempted, then the answer to the second question in the pair will not be evaluated. <i>Each will carry two marks</i>	For Q.21, $\frac{2}{3}$ mark will be deducted for wrong answer. There will be no negative mark for Q.22.

<b>XE Paper - General Aptitude (GA)</b>		
General Aptitude	There will be 10 questions carrying 15 marks in General Aptitude	
	Q.1 to Q.5 (5 questions) will carry one mark each (sub-total 5 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.6 to Q.10 (5 questions) will carry two marks each (sub-total 10 marks)	$\frac{2}{3}$ mark will be deducted for each wrong answer.

<b>XL Paper Section H (Chemistry)</b>		
Section H in XL paper	There will be 15 questions carrying 25 marks in XL Section H paper	
	Q.1 to Q.5 (5 questions) will carry one mark each (sub-total 5 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.6 to Q.15 (10 questions) will carry two marks each (sub-total 20 marks)	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	(Q.12, Q.13) will be <u>common data questions</u> Each question will carry two marks each	$\frac{2}{3}$ mark will be deducted for each wrong answer.
	Question pair (Q.14, Q.15) will have <u>linked answer question</u> Each question will carry two marks each There will be negative marks only for wrong answer to the first question of the linked answer question pair.	For Q.14, $\frac{3}{4}$ mark will be deducted for wrong answer. There is no negative mark for Q.15.

<b>XL Paper Sections (Sections I through M)</b>		
Sections I, J, K and L	XL section papers (Sections I through L) will contain 20 questions carrying 30 marks	
in XL paper	Q.1 to Q.10 (10 questions) will carry one mark each (sub-total 10 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.11 to Q.20 (10 questions) will carry two marks each (sub-total 20 marks).	$\frac{2}{3}$ mark will be deducted for each wrong answer.

<b>XL Paper - General Aptitude (GA)</b>		
General Aptitude	There will be 10 questions carrying 15 marks in General Aptitude	
	Q.1 to Q.5 (5 questions) will carry one mark each (sub-total 5 marks).	$\frac{1}{3}$ mark will be deducted for each wrong answer.
	Q.6 to Q.10 (5 questions) will carry two marks each (sub-total 10 marks)	$\frac{2}{3}$ mark will be deducted for each wrong answer.

## Types of multiple choice questions

Multiple choice questions in all papers and sections will contain four answers, of which only one is correct. The types of questions in a paper may be based on following logic:

(i) Recall:

These are based on facts, principles, formulae or laws of the discipline. The candidate is expected to be able to obtain the answer either from his/her memory of the subject or at most from a one-line computation.

### Example

Q. During machining maximum heat is produced

- (A) in flank face (B) in rake face  
(C) in shear zone (D) due to friction between chip and tool.

(ii) Comprehension:

These questions will test the candidate's understanding of the basics of his/her field, by requiring him/her to draw simple conclusions from fundamental ideas.

### Example

Q. A DC motor requires a starter in order

- (A) to develop a starting torque  
(B) to compensate for auxiliary field ampere turns  
(C) to limit armature current at starting  
(D) to provide regenerative braking

(iii) Application: In these questions, the candidate is expected to apply his/her knowledge either through computation or by logical reasoning.

### Example:

Q. The sequent depth ratio of a hydraulic jump in a rectangular channel is 16.48. The Froude number at the beginning of the jump is:

- (A) 10.0 (B) 5.0  
(C) 12.0 (D) 8.0

(iv) Analysis and Synthesis:

These can be linked questions, where the answer to the first question of the pair is required in order to answer its successor. Or these can be common data questions, in which two questions share the same data but can be solved independently of one another.

## Common data questions

Multiple questions may be linked to a common data problem, passage and the like. Two or three questions can be formed from the given common data problem. Each question is independent and its solution obtainable from the above problem data/passage directly. (Answer of the previous question is not required to solve the next question). Each question under this group will carry two marks.

### Example

Common Data, for instance, Questions 48 and 49 in main paper: Let  $X$  and  $Y$  be jointly distributed random variables such that the conditional distribution of  $Y$ , given  $X=x$ , is uniform on the interval  $(x-1, x+1)$ . Suppose  $E(X)=1$  and  $\text{Var}(X)=\frac{5}{3}$

First question using common data:

Q.48 The mean of the random variable  $Y$  is  
(A)  $\frac{1}{2}$  (B) 1 (C)  $\frac{3}{2}$  (D) 2

Second question using common data:

Q.49 The variance of the random variable  $Y$  is  
(A)  $\frac{1}{2}$  (B)  $\frac{2}{3}$  (C) 1 (D) 2

**Linked answer questions:**

These questions are of problem solving type. A problem statement is followed by two questions based on the problem statement. The two questions are designed such that the solution to the second question depends upon the answer to the first one. In other words, the first answer is an intermediate step in working out the second answer. Each question in such linked answer questions will carry two marks.

Example:

Statement for Linked Answer Questions, for instance, for Questions 52 and 53 in Main Paper:  
The open loop transfer function of a unity feedback control system is given by

$$G(s)H(s) = \frac{K}{s(s+1)(2s+1)(3s+1)}$$

First question of the pair:

Q.52 The value of K which will cause sustained oscillations in the closed loop system is

- (A)  $\frac{60}{121}$                       (B)  $\frac{70}{121}$   
(C)  $\frac{80}{121}$                       (D)  $\frac{90}{121}$

Second question of the pair:

Q.53 The frequency of sustained oscillations is

- (A)  $\frac{1}{12}$  rad/sec                      (B)  $\frac{1}{11}$  rad/sec  
(C)  $\frac{1}{\sqrt{12}}$  rad/sec                      (D)  $\frac{1}{\sqrt{11}}$  rad/sec

***The questions based on the above four logics may be a mix of single stand alone statement / phrase / data type questions, combination of option codes type questions or match items types questions.***