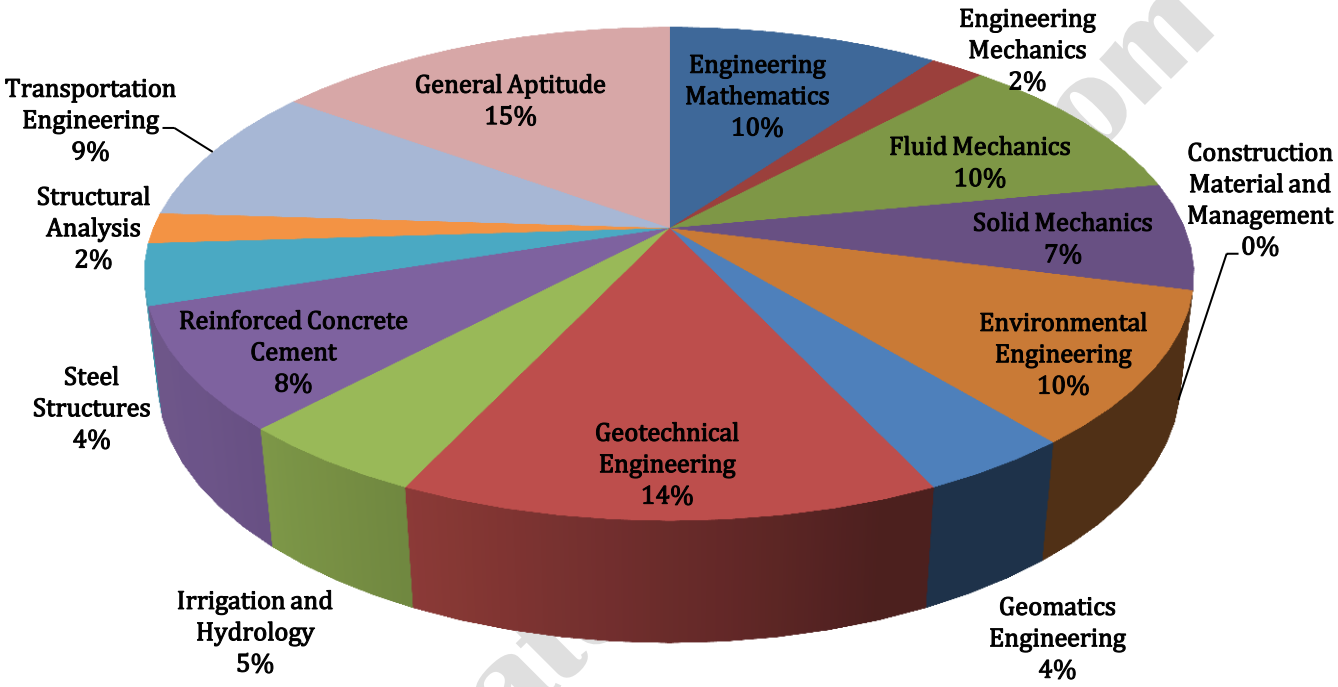
ANALYSIS OF GATE 2018* (Memory Based)

Civil Engineering



CE ANALYSIS-2018_11-Feb_Morning

SUBJECT	No. of Ques.	Topics Asked in Paper(Memory Based)	Level of Ques.	Total Marks
Engineering Mathematics	1 Marks: 4 2 Marks: 3	Matrix Methods; Maxima and Minima	Tough	10
Engineering Mechanics	1 Marks: 0 2 Marks: 1	Trusses and Frames	Medium	2
Fluid Mechanics	1 Marks: 4 2 Marks: 3	Fluid Properties; Fluid Statics; Boundary Layer; Flow through pipes; Hydraulic Machines; Open Channel Flow	Tough/Easy	10
Solid Mechanics	1 Marks: 1 2 Marks: 3	Simple Stress and Stain; Shear Force and Bending Moment; Stresses in Beams Deflection of Beams;	Medium	7
Construction Material and Management	1 Marks:0 2 Marks: 0	-	-	-
Environmental Engineering	1 Marks: 2 2 Marks: 4	Solid Waste Management; Air Pollution; BOD; Rapid Sand Filter	Medium	10
Geomatics Engineering	1 Marks: 0 2 Marks: 2	Theodolite and Traversing; Leveling;	Easy	4
Geotechnical Engineering	1 Marks: 4 2 Marks: 5	Soil Classification; Permeability and Seepage; Consolidation; Compaction; Stress Analysis; Shear; Strength	Medium	14
Irrigation and Hydrology	1 Marks: 1 2 Marks: 2	Irrigation; Hydrology	Medium/Easy	5
Reinforced Concrete Cement	1 Marks: 4 2 Marks: 2	Concrete Technology; Design of Pre-stressed Concrete Beams	Medium	8
Steel Structures	1 Marks: 2 2 Marks: 1	Welding Connection & Plastic Analysis	Medium	4
Structural Analysis	1 Marks: 0 2 Marks: 1	Deflection Of Truss; Slope And Deflection Of Structure	Medium	2
Transportation Engineering	1 Marks: 3 2 Marks: 3	Traffic Engineering; Highway Material; Geometric Design; Airport Engineering	Medium/Easy	9
General Aptitude	1 Marks: 5 2 Marks: 5	Equations, Geometry, Vocabulary, Functions	Tough	15
Total	**65**			**100**
Faculty Feedback	Majority of the question were concept based. General Aptitude And Mathematics is tough. Core Subject Questions were 50% Medium, 30% tough and 20% easy.			

GATE 2018 Examination*

Civil Engineering

Test Date: 11/02/2018

Test Time: 9:00 AM 12:00 PM

Subject Name: Civil Engineering

General Aptitude

Q.1 - Q.5 Carry One Mark each.

1. Tower A = 90 m tall, Tower B = 140 m tall. They are 100 m apart. A horizontal skywalk connects the floors at 70 m in both the towers. If a tent rope connects the top of Tower A, to the bottom of Tower B, at what distance (m) from Tower A will the rope intersect the skywalk?
   (A) (B)
   (C) (D)
   [Ans. *] Will update soon

2. Hama's age is 5 years more than twice of Hari's age. Suresh age is 13 years less than 10 times Hari's age. If Suresh is 3 times as old as Hema, how old is Hema?
   (A) 14 (B) 17
   (C) 18 (D) 19
   [Ans. *] Will update soon

3. The driver applied the _____ as soon as she approached the hotel where she wanted to take a _____?
   (A) Brake, Break (B) Break, Break
   (C) Brake, Brake (D) Break, Brake
   [Ans. *] Will update soon

4. It is no surprise that every society has had codes of behavior; however the nature of these codes is often _____?
   (A) Unpredictable (B) Simple
   (C) Expected (D) Strict
   [Ans. *] Will update soon

5. The temperature T in a room varies as a function of the outside temperature T_0 and the number of persons in the room p, according to the relation $T = k(\theta p + T_0)$ where θ, k = constant. What would be the value of θ which gives the following data?

T_o	p	T
25	2	32.4
30	5	42

(A) 0.8 (B) 1.0
(C) 2.0 (D) 10.0
[Ans. *] Will update soon

Q.6 - Q.10 Carry Two Mark each.

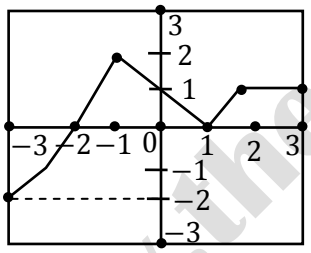
6. If $a_n = \frac{1}{n} - \frac{1}{n+2}$ where n is an integer ($n > 0$), the sum of first 50 numbers is _____?
[Ans. $1 + \frac{1}{2} - \frac{1}{51} - \frac{1}{52}$]

7. If A, B, C, D, E, F, G are unique numbers from 1 to 9 and in such a manner that $A \times B \times C = D \times E \times F = B \times G \times E$

A		D
B	G	E
C		F

Then A, B, C, D, E, F, G cannot be
(A) 4 (B) 5
(C) 6 (D) 9
[Ans. B]

8. Which of the following functions is correct for the given graph in the given ranges?



(i) $y = 2x + y$ for $-3 \le x \le -1$
(ii) $y = |x - 1|$ for $-1 \le x \le 2$
(iii) $y = \big||x| - 1\big|$ for $-1 \le x \le 2$
(iv) $y = 1$ for $2 \le x \le 3$
(A) (i), (ii), (iii) (B) (i), (ii), (iv)
(C) (i) and (iv) (D) (ii) and (iv)
[Ans. B]

9. A fruit seller sold a basket of fruits at 12.%% loss. Had he sold it for Rs.108 more, he would have made a 10% gain. What is the loss in Rs. incomed by the seller?
(A) 48 (B) 52
(C) 60 (D) 108
[Ans. *]

10. The price of a wire made of a super alloy material is proportional to the square of its length. The price of 10 m length of wire is 1600. What would be the total price of two wires of lengths 4m and 6m?
(A) 768 (B) 832
(C) 1440 (D) 1600
[Ans. *]

Technical

1. → RG 1 2 3 4 5 6
RD(mm) 470 465 435 525 480 610
Area of The section (10^4 m^2) 95 100 98 80 85 92 Thiessen mean value in mm_____
[Ans. *] Will update soon

2. In a L_a b, flow expression is performed over a hydro value struct . measured $Q = 0.05\,M^3/s\,V = 0.25\,M/s$ full scale strut (30 times bigger) is subjected to discharge of 270 m^3 then time scale model to full scale value is_____
[Ans. *] Will update soon

3. The ultimate box of a wastewater sample is estimated as 87% of COD . Con=300 mg/L , $k = 0.23\ day^{-1}$ temperature co-=1.047, BOD_3 Q 27℃
[Ans. *] Will update soon

4. Given orthogonal matrix
$$Q = \begin{bmatrix} \frac{3}{7} & \frac{2}{7} & \frac{6}{7} \\ -\frac{6}{7} & \frac{3}{7} & \frac{2}{7} \\ \frac{2}{7} & \frac{6}{7} & -\frac{3}{7} \end{bmatrix}$$
The inverse is =?
[Ans. *] Will update soon

5. At the point x=0, the function $f(x) = x^3$ has
(A) Local maximum
(B) Local minimum
(C) Both local maximum and minimum
(D) Neither local maximum and local minimum
[Ans. *] Will update soon

6. Which of the following matrix is singular =?
$\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ $\begin{bmatrix} 3 & 2 \\ 2 & 3 \end{bmatrix}$ $\begin{bmatrix} 2 & 4 \\ 3 & 6 \end{bmatrix}$ $\begin{bmatrix} 4 & 3 \\ 6 & 2 \end{bmatrix}$
[Ans. *] Will update soon

7. The solution at x=1 of the differential equation $\frac{d^2y}{dx^2} + 2.\frac{dy}{dx} + y = 0$ subjected to boundary condition $y(0) = 1, \frac{dy}{dx}(0) = -1$ is _____?
[Ans. *] Will update soon

8. The solution at x=1, t=1 of the partial differential equation , $\frac{\partial^2 4}{\partial x^2} = 25\frac{\partial^2 4}{dt^2}$ subjected to initial condition $n(0) = 3x, \frac{\partial u}{\partial t}(0) = 3$ is _____
(A) 1 (B) 2
(C) 4 (D) 6
[Ans. *] Will update soon

9. The value of the integral $\int_0^n x\cos^2 x.\,dx$ is = ?
(A) $n^2/8$ (B) $n^2/4$
(C) $n^2/2$ (D) n^2
[Ans. *] Will update soon

10. A 1:50 model of a spillway is to be tested in lab. The discharge in prototype Spillway = $1000 m^2/sec$.Tehe corresponding discharge to be maintained in the model?
[Ans. *] Will update soon

11. A 10 m wide rectangular channel carries a discharge of 20 m^3/sec under critical condition using $g = 9.81 m/s^2$.Specific energy (in m) _____?
[Ans. *] Will update soon

12. Bernoulli's equation is applicable for
(A) Viscous and compressible fluid flow
(B) In-viscous and compressible fluid flow
(C) In -viscous and in-compressible fluid flow
(D) Viscous and incompressible fluid flow
[Ans. *] Will update soon

13. A flow field is given by $u = y^2, v = -xy, w = 0$.Value of the z-component of angular velocity (in radian per unit time) at the point $(0, -1, 1)$_____?
[Ans. *] Will update soon

14. In a lab, a flow experiment is performed over a hydraulic string. The measured values of discharge and velocity are 0.05 m^3/sec and 0.25 m/sec. If the full scale string (30 times bigger) is subjected to a discharge of 270 m^2/sec,then the time scale (model to full scale) value is_____?
[Ans. *] Will update soon

15. A closed tank contains 0.5 m thick layer of mercury (Special gravity=13.6) at bottom .A 20 m thick layer of water lies above the mercury layer. A 30 m thick layer of oil (Special gravity=0.6) lies above the water layer. The space above the oil layer contains air pressure

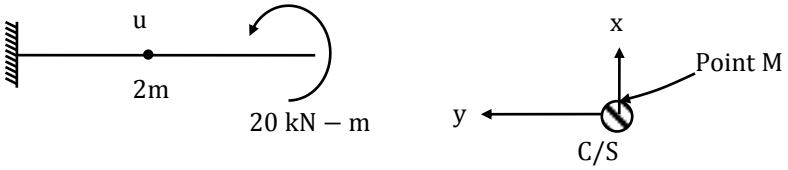
The gauge pressure at the bottom of tank is 196.2 kN/m^2. The density of water=1000 kg. m^3 and g = 9.81 m/s^2.The value of pressure in the air space?

(A) 92.21 N/m^2 (B) 95.644 N/m^2

(C) 98.922 N/m^2 (D) 99.321 N/m^2

[Ans. *] Will update soon

16. A solid circular beam with radius of 0.25 m and length of 2m is subjected to a twisting moment of 20 kN-m, about z-axis .The shear stress component τ_{xy} at point 'M' in C/S of the beam at a distance of 1m from fixed end=?



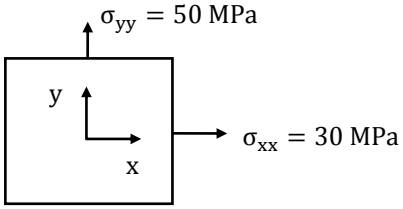
(A) 0 (B) 0.51

(C) 0.815 (D) 2

[Ans. *] Will update soon

17. $y = 2 \times 10^{11} \frac{N}{m^2}, \mu = 0.3$

if σ_{zz} is negligibly small and assumed to be zero, then strain ϵ_{zz} =?



(A) -120×10^{-6} (B) -60×10^{-6}

(C) 0 (D) 120×10^{-6}

[Ans. *] Will update soon

18. In fillet weld, the direct shear stress and bending tensile stress =50 and 150 MPa. As per IS 800:2007.equivalent stress=?

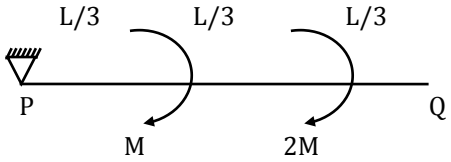
[Ans. *] Will update soon

19. A column of height 'h' with rec C/S of 2 × 2 has buckling load P. If C/S change to 0.5 a and height 1.5 h, then buckling load of

$\frac{P}{12}, \frac{P}{4}, \frac{P}{2}, \frac{3P}{4}$?

[Ans. *] Will update soon

20. SSB, uniform EI, slope at P



(A) 0

(B) $\frac{ML}{9EI}$

(C) $\frac{ML}{6EI}$

(D) $\frac{ML}{3EI}$

[Ans. *] Will update soon

21. Variation of water depth (y) in G.V O.C.F is given by first order differential equation/ $\frac{dy}{dx} = \frac{1-e^{\frac{10}{3}\ln(y)}}{250-45\,e^{-3\ln(y)}}$ .Given initial conditions, y(x=0), 0.8 the depth in m of flow at downstream section at x=1m from one. Calculation step of single step Euler method is _____

[Ans. *] Will update soon

22. A cantilever beam of 2m with square section of side length 0.1 m, is loaded vertically at free end=5 mm. The beam is made of steel $\gamma = 2 \times 10^{11}$ N/m^2 .The maximum bending stress=?

(A) 20

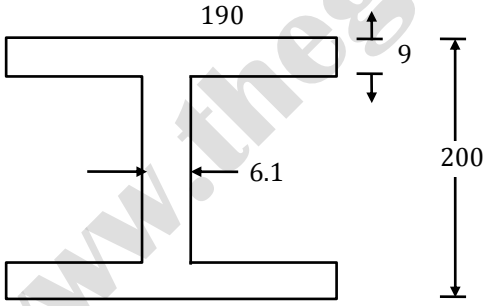
(B) 37.5

(C) 60

(D) 75

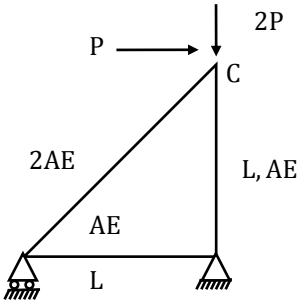
[Ans. *] Will update soon

23. The dimensions of a symmetrical welded I-section are shown in figure plastic section modulus (in cm^3) about weaker axis?



[Ans. *] Will update soon

24. $E = 2 \times 10^{11}\ N/m^2$
$A = 10\ mm^2$
L=1m,P=1kN
Horizontal displacement at e(mm)=?



[Ans. *] Will update soon

More Questions Update Soon