



# SSC JE 2020-21 Tier-1 CIVIL ENGINEERING

**23rd March**

**Shift-2**

**Memory Based  
Questions with Solutions**

10+ Gradians  
Under **AIR 10**



Sahi Prep Hai Toh Life Set Hai

## SSC JE 2020-21 Civil Subject Weightage Analysis

SSC JE 2020-21 Shift-2 Subject Analysis		
Subject	Difficulty Level	No. of Questions
Building Materials & Concrete Technology	Moderate to Easy	7-8
Estimation, Costing and Valuation	Easy	8-10
Surveying	Moderate to calculative	5-6
Soil Mechanics	Easy	6-8
Fluid Mechanics & Hydraulics	Moderate	4-5
Irrigation Engineering	Easy	6
Transportation Engineering	Easy	8-9
Environmental Engineering	Moderate	5-6
Theory of Structures (SOM+SA)	Moderate to Easy	7-8
RCC Design	Easy	9-10
Steel Design	Easy	4-5
Reasoning	Moderate	50
General Awareness	Moderate to Difficult	50
<b>OVERALL</b>	<b>Moderate</b>	<b>200 Qs</b>

## CIVIL ENGINEERING

### Questions Shift-II (Memory Based)

1. What is the Slenderness ratio of compression member subjected to dead load and Live Load  
Sol. slenderness ratio must not be greater than 180

2. Give an example of Sedimentary rock  
A. granite  
B. gneiss  
C. limestone  
D. Dolerite

Ans. C

Sol. granite is igneous rock  
Genesis is a metamorphic rock  
Limestone is a sedimentary rock  
Dolorite is igneous rock

3. What is the maximum permission limit of TDS in water  
Sol. as per IS 10500:2012,  
Permissible limit must not be greater than 500 mg/L  
Cause for rejection limit must not be greater than 2000 mg/L

4. Calculate discharge for a rectangular channel,  $C= 50$ ,  $s= 1/900$ ,  $b=2$  and  $y=4$  ,

Sol.  $= AC\sqrt{mi}$   
 $= 4 \times 2 \times 50 \sqrt{\frac{1}{900} \times \frac{4}{4}}$   
 $= 13.33 \text{ m}^3/\text{s}$

5. What is the correct order of Map study, preliminary survey , reconnaissance survey  
Sol. the correct order is map study, reconnaissance survey, preliminary survey and detailed survey.

6. For a 30 m chain measured value =450 m, short value 0.2 links, calculate the true value of line measured

Sol. 1 link = 20 cm  
0.2 links = 0.2 x 20 = 4 cm = 0.04 m  
Right x right = wrong x wrong  
 $L \times l = L' \times l'$   
 $30 \times l = 450 \times (30-0.04)$   
 $l = 449.4 \text{ m}$

7. Find the shortest length for a latitude of 40 m and departure of 30 m?

Sol. Shortest length =  $\sqrt{(30^2 + 40^2)} = 50$  m

8. What is the name given to the condition when the canal runs above the drainage levels?

Ans. aqueduct

9. What is the slenderness ratio for a tension member?

Sol. slenderness ratio must not be greater than 400

10. Fineness of cement measured by which method

Sol. Sieve test, air permeability test- blaints apparatus

11. What is the water absorption of class A tiles

Sol. water absorption < 0.5%

12. What is range of alumina in bricks

Ans. 20-30%

14. What is the unit weight of glacial soil

Ans. the unit weight of glacial soil is 22.5 kN/m<sup>3</sup>- 23.5 kN/m<sup>3</sup>

15. Which soil is classified as soil of  $I_p = 21\%$

Ans. for  $I_p > 7\%$ ; highly plastic clay

16. Felled tree timber is called as .....

Ans. dead wood

17. What is the minimum and maximum percentage of reinforcement in column?

Sol. minimum percentage = 0.8%

Maximum percentage (in case of lapping) = 4%

Maximum percentage (in case of No- lapping) = 6%

19. Definition of Limit state of collapse

Sol. Limit state of collapse deals with the strength and stability of structures subjected to the maximum design loads out of the possible combinations of several types of loads.

20. What is the chemical name of alum?

Ans. potassium aluminium sulphate

21. Height of upper hopper and bottom hopper in compaction factor test

Ans. 20.3 cm

Description	Dimension CM
<b>Upper Hopper, A</b>	
Top Internal Diameter	25.40
Bottom Internal Diameter	12.70
Internal Height	27.90
<b>Lower Hopper, B</b>	
Top Internal Diameter	22.90
Bottom Internal Diameter	12.70
Internal Height	22.90
<b>Cylinder, C</b>	
Internal Diameter	15.20
Internal Height	30.50
Distance between bottom of upper hopper and top of lower hopper	20.30
Distance between bottom of lower hopper and top of cylinder	20.30

22. What is the Reynold's no for a laminar flow in a pipe?

Sol. Pipe flow remains laminar until a Reynold's number of 2000 and becomes turbulent above 4000.

23. What is the .max limit of flakiness index in aggregate.

Sol. It is desirable that the flakiness index of aggregates used is less than 15% and normally does not exceed 25%.

24. What is the max limit of stripping value of bitumen.

Sol. IRC has specified that the stripping value of aggregates should not exceed 25%.

25. Duty = 400 ha/cumecs

Base period = 100 days

Delta =?

Sol. 
$$\Delta = \frac{8.64B}{D} = \frac{8.64 \times 100}{400} = 2.16 \text{ m}$$

26. For In Deep Beams, what is the Eff. Length upon overall depth ratio.

Sol. As per Is 456:2000

A beam shall be deemed to be a deep beam when the ratio of effective span to overall depth,

$\frac{l}{D}$  is less than:

- 1) 2.0 for a simply supported beam; and
- 2) 2.5 for a continuous beam

27. Expansion joints is measured in

Ans. meter

28. What is the Deflection of a cantilever beam at free end subject to point load?

Sol. 
$$\delta = \frac{PL^3}{3EI}$$

Where,

P = Point load.

L = Length of beam.

EI = Flexural rigidity.

29. What Deflection of a cantilever beam subjected to UDL?

Sol. 
$$\delta = \frac{wL^4}{8EI}$$

Where,

w = Uniformly distributed load.

L = Length of beam.

EI = Flexural rigidity.

30. If Design Axial load of column (including footing) = 1720KN

& SBC = 200KN/m sqr.

Value of Area of footing required ?

Sol. Total load on footing= 1.1x 1720= 1892 kN

Area of footing= 1892/200= 9.46 m<sup>2</sup>

31. True Sp. Gravity = 2.7

Mass Sp. Gravity = 2.4

What will be the Void Ratio?

Sol. Assuming the specimen to be in a dry state.

$$e_d = \frac{G}{1+e} e_w$$

$$2.4 = \frac{2.7}{1+e} \times 1 \Rightarrow 1+e = \frac{2.7}{2.4}$$

$$e = \frac{2.7}{2.4} - 1 = 0.125 = 12.5\%$$

32. If Dead Load = 20 KN

& Live Load = 12 KN

What will be the design load after applying partial safety factor?

Sol. Partial safety factor for both dead and live load is 1.5.

Design Load = 1.5DL+1.5LL = 1.5 × 20 +1.5 × 12 = 48 kN



33. Width of road = 5m

Outer edge of road raised by 40 cm. Then what will be the value of rate of super elevation?

Sol. Rate of superelevation =  $e(\text{cm})/w(\text{m}) = 40/5 = 8\%$

34. given WCB =  $336^\circ 40'$

Convert in RB?

Sol. Given angle will fall in the 4th quadrant.

Reduced bearing =  $N(360^\circ - 336^\circ 40')W = N23^\circ 20'W$

## GENERAL AWARENESS

1. Who is known as the Father of Indian Communism?

Sol. Manabendra Nath Roy (22 March 1887 – 25 January 1954), born Manabendra Nath Bhattacharya, was an Indian revolutionary, radical activist and political theorist, as well as a noted philosopher in the 20th century.

2. Who is the new chairman of SBI , made in December 2020?

Ans. Dinesh Kumar Khara

3. Which city of harappan civilization is in INDIA?





Sol. The civilization was first identified in 1921 at Harappa in the Punjab region and then in 1922 at Mohenjo-daro (Mohenjodaro), near the Indus River in the Sindh (Sind) region.

4. Which state is not located on the basin of Tapi river?

- A. Rajasthan
- B. Pune
- C. Gujurat
- D. Karnatak

Ans. D

5. Which relation best specifies mother, son and daughter?

- A. 
- B. 
- C. 
- D. 

6. Which vitamin deficiency cause Scurvy ?

Sol. Scurvy is a disease caused by severe and chronic vitamin C (ascorbic acid) deficiency. Good sources of dietary vitamin C include citrus fruits and green vegetables.

7. When is World Water day?

Ans. 22 March 1993



8. Beri-Beri disease is caused due to which vitamin.

Sol. Beriberi is a disease caused by a vitamin B-1 deficiency, also known as thiamine deficiency. There are two types of the disease: wet beriberi and dry beriberi. Wet beriberi affects the heart and circulatory system. In extreme cases, wet beriberi can cause heart failure.

Treatments: Thiamine

Symptoms: Paralysis

9. India given ambulances to which country?

Sol. **India** gifts 41 **ambulances** and 6 school buses to Nepal on Gandhi Jayanti. **India** has gifted forty one **ambulances** and six school buses to various governmental and NGOs working in the field of health and education in Nepal.

10. How many gold medals india won in Asia champion ship?

Sol. Asian Athletics Championships 2019: PU Chitra wins 1500m gold, India finishes with 17 medals

11. Which park recognised in Madhya Pradesh by unesco

Sol. Panna National Park in Madhya Pradesh has been declared a UNESCO Biosphere Reserve.

12. What is the SI unit of time?

Sol. The second, symbol s, is the SI unit of time.

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3	Teja Sri	Mechanical	8601201160	13	Maheswar Behera	Mechanical	4604007751
4	Shital	Mechanical	7205713172	14	Paras Gupta	Mechanical	6015400275
5	Y Sreekanth	Mechanical	10000571203	15	Hemant Chaturvedi	Mechanical	2405001436
6	Latha B	Mechanical	9010000312	16	Paras Gupta	Mechanical	6015400275
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