



# **SSC JE 2019 Tier-1**

## **CIVIL ENGINEERING**

**30th Oct.**

**Shift-1**

**Memory Based**  
**Questions with Solutions**

## CE | EE | ME

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## SSC JE 2019 Civil Subject Weightage Analysis

Subject Analysis Shift-1 (30-10-2020) (Memory Based)		
Subject	Difficulty Level	No. of Questions
Building Materials & Concrete Technology	Easy	12-14
Estimation, Costing and Valuation	Easy	7-8
Surveying	Easy	7-8
Soil Mechanics	Easy	8-10
Fluid Mechanics & Hydraulics	Easy	11-12
Irrigation Engineering	Moderate	3-4
Transportation Engineering	Easy	6-8
Environmental Engineering	Moderate	7-8
Theory of Structures (SOM+SA)	Moderate	12-14
RCC Design	Easy	6-8
Steel Design	Easy	6-8
Reasoning	Difficult	50
General Awareness	Moderate	50
<b>OVERALL</b>	<b>Moderate</b>	<b>200 Qs</b>

## CIVIL ENGINEERING

### Questions Shift-I (Memory Based)

1. What is the unit of Kinematic Viscosity?

Sol. In SI unit it is  $m^2/sec$  and in CGS it is Stoke.

2. What is the tensile strength of M25?

Sol.  $0.7 \times \sqrt{f_{ck}} = 0.7 \times 5 = 3.5 \text{ MPa}$

3. How can rutting be prevented on the highway?

Sol. Rutting is fixed by filling the depression with premix material

4. Which coat is applied to loose aggregate in the highway ?

Sol. Prime coat is applied to loose aggregate in the highway.

5. Soundness test apparatus?

Sol. Unsoundness due to lime can be measured by Le- Chatelier's apparatus.  
Unsoundness due to magnesia can be measured by Autoclave test.

6. Modular size of brick ?

Sol. Modular size of brick is  $19 \times 9 \times 9$

7. What is Aqueduct?

Sol. When the HFL of the drain is sufficiently below the bottom of the canal such that the drainage water flows freely under gravity, the structure is known as Aqueduct.

8. Calculate RL

Sol.  $H.I. = RL \text{ of Benchmark} + BS$

So,  $RL \text{ required station} = H.I. - FS \text{ to the required station.}$

9. Straight line method depreciation numerical..

Sol.  $\text{Depreciation} = (\text{Initial cost} - \text{Salvage Value}) / \text{Life Span}$

10. Calculate Sleeper density

Sol. It is defined as the number of sleepers required under one rail **length** of railway track. It is expressed as  $(n + x)$  where  $n$  is the **length** of one rail in meter and  $x$  is constant whose value varies from 3 to 6 (**length** of one rail is 12.8 m for B.G.)

11. In survey, Benchmark is related to?

Sol. Benchmark is related to levelling work.

12. What is the grade of RCC in a severe zone?

Sol. M30

13. What are the advantages of the Rise and fall method over HI method?

Sol. Rise and fall method provides check on Back sight, Intermediate sight and Fore sights. Also, it requires less calculations.

14. What is the purpose of the Compaction Factor Test?

Sol. Compaction Factor test is used to measure workability of concrete.

15. Find Slenderness Ratio of tension members which are not subjected to wind loads?

Sol. Max. Slenderness Ratio = 400

16. Fe550 given and dia of bar 12mm. Calculate development length.

Sol.  $L_d = \sigma\phi / 4\tau$

$$\text{So, } L_d = 0.87 f_y \times (12) / 4 \tau$$

$$= 0.87 \times 550 \times 12 / 4 \tau = 1435.5 / \tau$$

17. There is a 5m long fixed beam carrying point load at 2m from the left side. Calculate the value of  $M_a$  and  $M_b$ .

Sol.  $M_a = Pab^2/L^2 = P \times 2 \times 9/25 = 0.72 P$

$$M_b = Pa^2b/L^2 = P \times 4 \times 3/25 = 0.84P$$

18. What is the carpet area percentage in a building?

Sol. Carpet Area is approximately 70 %

19. What is the hydraulic mean depth for the trapezoidal section of depth 3m?

Sol. For efficient section,  $3Y/4$ , so when  $Y= 3$ , Hydraulic mean depth is 2.25m

20. What is the standard size of modular brick?

Sol. Standard size of modular brick is  $19 \times 9 \times 9$

21. Dimension of beam given as 450\*500. Grade of steel is Fe500. find min,  $A_{st}$  percentage.

Sol. Min.  $A_{st} = 85/f_y = 85/500 = 0.17 \%$

22. Find min. eccentricity of an axially loaded column of dimension  $400 \times 400$  mm

Sol.  $e_{\min} = 0.05 D = 0.05 \times 400 = 20$  mm

23. Definition of shrinkage limit.

Sol. shrinkage limit is the minimum water content at which soil is saturated and also it is max water content on which on drying vol doesn't change.

24. Soil is designed for which strength?

- A. Bending
- B. Shear
- C. Axial

Sol. Soil is designed for Shear strength. Hence option-B is correct.

25. Stress distribution of rigid footing on clay soil?

Sol. It is less at centre but more at edges.

26. For OPC, setting time should not be more than?

Sol. For OPC, initial setting time should not be more than 30 min and the final setting time is 10 hours.

27. Purlin is tension or compression member?

Sol. Purlin is a compression member.

28. What is the Specific surface for RH cement?

Sol. Specific Surface for RH Cement =  $3250 \text{ cm}^2/\text{gm}$

29. What is the permissible limit of fluoride ?

Sol. Permissible limit is 1 mg/l and cause of rejection is 1.5 mg/l

30. Which substance is produced in landfill.

Sol. Leachate, which is a cancer causing compound is produced in landfill.

31. Which type of rollers are used for sandy soils?

Sol. Vibratory rollers are used.

32. What are Indore and Bangalore process?

Sol. Indore process is a aerobic composting method and Bangalore process is a anaerobic composting method of solid waste



33. Which compound gives red color to clay bricks?

Sol. Red color of brick is due to the presence of Iron Oxide.

34. Given property cost: Rs. 50,000. Life of property = 50 years. Assume scrap value as 10%. What will be the value of property after 30 years.

Sol.  $D = C - S/n$

$$= (50,000 - 5000)/50 = 900 \text{ Rs.}$$

$$\text{So, Dep. in 30 years} = 30 \times 900 = 27000 \text{ Rs.}$$

$$\text{So Value} = 50,000 - 27,000 = 23,000 \text{ Rs.}$$

35. Limestone is which type of rock?

Sol. Limestone is a sedimentary rock.

36. Is V notch better than rectangular notch?

Sol. A triangular notch gives more accurate results for low discharge than rectangular notch and the same triangular notch can measure a wide range of flow accurately. Actual discharge of V-notch is better than the rectangular notch.

37. Which equation is followed by real, ideal and newtonian fluid?

Sol.  $\tau = \mu \cdot (du/dy)$

38. A curve of radius 60m, and gradient is 6%. What is the compensated gradient?

Sol. Grade Compensation:  $\frac{(30 + R)}{R} \times \frac{75}{R}$

$$\text{So, } \frac{90}{60} = 1.5\% \times \frac{75}{60} = 1.25\%$$

Hence, GC= 1.25 %.

$$\text{So C.G.} = 6 - 1.25 = 4.75 \%$$

39. What is the formula of Degree of Static Indeterminacy of Truss.

Sol. D.S.I of a plane truss =  $m + r - 2j$

D.S.I of a space truss =  $m + r - 3j$

## GENERAL AWARENESS

1. Which state is best in governance?

Sol. Tamil Nadu, Tamil Nadu tops good governance index among all the states.

2. One question on the Statue of Unity Island.

Sol. Sadhu Bet, The Statue of Unity is located on the river island of Sadhu Bet near Rajpipla in Gujarat. The statue was inaugurated by Prime Minister Narendra Modi on October 31, 2018 to commemorate the 143rd birth anniversary of India's first Home Minister Sardar Vallabhbhai Patel.

3. One question on Sardar Sarovar Dam.

Sol. The Sardar Sarovar Dam is a concrete gravity dam on the Narmada river in Kevadiya near Navagam, Gujarat in India. Four Indian states, Gujarat, Madhya Pradesh, Maharashtra and Rajasthan, receive water and electricity supplied from the dam.

4. Which among the following is the best nation in human development?

Sol. Norway, Norway has an HDI Index of 0.954.

5. Which Party got 3rd highest seat in Lok Sabha Elections 2019?

Sol. DMK, DMK secured 23 seats. BJP got 303 seats out of 542 seats.

6. Who is the speaker of Lok Sabha?

Sol. Om Birla, Om Birla of the Bharatiya Janata Party is the current Speaker who presides over the 17th Lok Sabha.

7. What is the Chandra Sekhar limit?

Sol. The Chandrasekhar limit is the maximum mass of a stable white dwarf star.

8. What is the God particle?

Sol. Higgs Boson, In 2012, scientists confirmed the detection of the long-sought Higgs boson, also known by its nickname the "God particle," at the Large Hadron Collider (LHC), the most powerful particle accelerator on the planet.

9. What is pedology?

Sol. Pedology is a discipline within soil science which focuses on understanding and characterizing soil formation, evolution, and the theoretical frameworks through which we understand a soil body, often in the context of the natural environment.

10. Which is the cleanest city?

Sol. Indore, Indore has topped the ranking in the cleanest city category (having more than one lakh population), and is followed by Surat, Navi Mumbai. Vijayawada and Ahmedabad in that order.

11. Atal pension Yojana is funded by ?

- A. IMF
- B. Asian Development Bank
- C. World Bank

12. Largest party in the current Lok Sabha?

Sol. BJP is the largest party in the current Lok Sabha.

13. Statue of Unity is situated exactly where in Gujarat?

Sol. Sardar Sarovar Dam, Kevadiya Village Narmada, Gujarat.

14. Name of Indian Navy 2019 Naval Exercise?

Sol. Exercise Malabar 2019, The 23rd edition of the Trilateral Maritime Exercise MALABAR, was conducted between the navies of India, Japan and USA from 26 September to 04 October 2019 off the coast of Japan.

15. How long is the Goldilocks zone?

Sol. Estimates for the habitable zone within the Solar System range from 0.38 to 10.0 astronomical units

16. Who was the first woman navy pilot?

Sol. Sub Lieutenant Shivangi became the first female Indian naval pilot on 2 December 2019.

17. Which of them is not a direct tax?

Sol. Indirect taxes are those applied on the manufacture or sale of goods and services. These are initially paid to the government by an intermediary, who then adds the amount of tax paid to the value of the goods / services and passes on the total amount to the end user. Examples : Sales tax, service tax, excise duty.

18. What is the other name of Bombay Stock Exchange?

Sol. BSE Limited.

19. Atal tunnel passes through which pass ?

Sol. Atal Tunnel (also known as Rohtang Tunnel) is a highway tunnel built under the Rohtang Pass in the eastern Pir Panjal range of the Himalayas on the Leh-Manali Highway in Himachal Pradesh, India.

20. Which is the sensitive part of the eye which contains the cell?

Sol. Retina: a light sensitive layer that lines the interior of the eye. It is composed of light sensitive cells known as rods and cones. The human eye contains about 125 million rods, which are necessary for seeing in dim light.



21. Where is the Pench Tiger National Park?

Sol. Madhya Pradesh

22. Who was the President when the age of voting got reduced from 21 to 18 years?

Sol. President Ramaswamy Venkataraman, The bill, after ratification by the States, received assent from then President Ramaswamy Venkataraman on 28 March 1989. It was notified in The Gazette of India, and also came into force on the same date.

23. What is the Tyndall effect?

Sol. Light Scattering Effect, the Tyndall effect is light scattering by particles in a colloid or in a very fine suspension.

24. What is the capital of Jordan?

Sol. Capital: Amman (with a population of about 2 million)

25. Jaduguda mines, a place in Jharkhand is famous for which mineral?

Sol. Uranium mines, the Jaduguda Mine Is a uranium mine in Jaduguda village in the Purbi Singhbhum district of the Indian state of Jharkhand.

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## SSC JE 2019 Civil Expected Cutoff

Expected Cutoff (SSC JE Tier-1)					
Years	General	EWS	OBC	SC	ST
2019 (Shift-1) (30-10-2020)	121	116	120	104	104
2019 (29-10-2020)	125	119	123	110	110
2018	127.40	118.99	122.91	107.61	107.01
2017	117	-	110.75	101.75	105
2016	100	-	92.50	84.50	85.50
2015	103.75	-	91.25	88	87.75
2014	93.75	-	82	75.75	70
2013	78	-	70.50	66.25	63.50
2012	62.25	-	52.50	47.75	43.50

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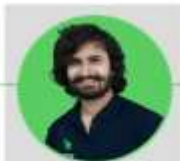
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