

SSC Junior Engineer Question Paper 2013

SA

DO NOT OPEN THE SEAL OF THE BOOKLET UNTIL YOU ARE TOLD TO DO SO

BH 2013
PAPER I
प्रश्न-पत्र I

Test Form No.
टेस्ट फॉर्म सं.
888 KO 9

Time Allowed : 2 Hours

Maximum Marks : 200

निर्धारित समय : 2 घंटे

अधिकतम अंक : 200

Read the following instructions carefully before you begin to answer the questions. This Booklet contains questions in English as well as in Hindi.
प्रश्नों के उत्तर देने से पहले नीचे लिखे अनुदेशों को ध्यान से पढ़ लें। इस पुस्तिका में प्रश्न अंग्रेजी तथा हिन्दी दोनों में दिये गये हैं।

INSTRUCTIONS TO CANDIDATES

- This Booklet contains 200 questions in all comprising the following three tests :
Test (i) : General Intelligence and Reasoning (50 Questions)
Test (ii) : General Awareness (50 Questions)
Test (iii) : Part - A : General Engineering (100 Questions)
(Civil and Structural)
OR
Part - B : General Engineering (100 Questions)
(Electrical)
OR
Part - C : General Engineering (100 Questions)
(Mechanical)
- In questions set bilingually in English and Hindi, in case of discrepancy, the English version will prevail.
- Test-I General Intelligence and Reasoning and Test-II General Awareness are compulsory for all the candidates. Candidates are required to attempt only one Section in Test-III General Engineering i.e. Part A Civil and Structural OR Part B Electrical OR Part C Mechanical as per option in the application form given by the candidates failing which you will be awarded 'ZERO' mark.
- All questions are compulsory and carry equal marks.
- The paper carries negative marking. 0.25 marks will be deducted for each wrong answer.
- Before you start to answer the questions you must check up this Booklet and ensure that it contains all the pages (1-80) and see that no page is missing or repeated. If you find any defect in this Booklet, you must get it replaced immediately.
- You will be supplied the Answer-Sheet separately by the Invigilator. Before you actually start answering the questions, you must complete and code the details of Name, Roll Number, Ticket Number, Name of the examination as mentioned in the admission certificate, Date of birth, Test Form Number and Stream i.e. Civil and Structural OR Electrical OR Mechanical etc., on Side-I of the Answer-Sheet carefully. You must also put your signatures and left hand thumb impression on the Answer-Sheet at the prescribed place before you start answering the questions. These instructions must be fully complied with, failing which, your Answer-Sheet will not be evaluated and you will be awarded 'ZERO' mark.
- Answers must be shown by completely blackening the corresponding ovals on Side-II of the Answer-Sheet against the relevant question number by Black/Blue Ball-point Pen only. Answers which are not shown by Black/Blue Ball-point Pen will not be awarded any mark.
- A machine will read the coded information in the OMR Answer-Sheet. In case the information is incomplete or different from the information given in the application form, such candidate will be awarded 'ZERO' mark.
- The Answer-Sheet must be handed over to the Invigilator before you leave the Examination Hall.
- Failure to comply with any of the above instructions will render a candidate liable to such action/penalty as may be deemed fit.
- The manner in which the different questions are to be answered has been explained at the back of this Booklet (Page No. 80), which you should read carefully before actually answering the questions.
- Answer the questions as quickly and as carefully as you can. Some questions may be difficult and others easy. Do not spend too much time on any question.
- No rough work is to be done on the Answer-Sheet. Space for rough work has been provided below the questions.
- "Mobile phones and wireless communication devices are completely banned in the examination halls/rooms. Candidates are advised not to keep mobile phones/any other wireless communication devices with them even switching it off, in their own interest. Failing to comply with this provision will be considered as using unfair means in the examination and action will be taken against them including cancellation of their candidature."

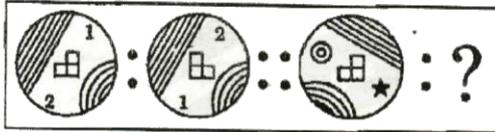
उम्मीदवारों के लिए अनुदेश

- इस पुस्तिका में कुल 200 प्रश्न हैं, जिनमें निम्नलिखित तीन परीक्षण शामिल हैं :
परीक्षण (i) : सामान्य बुद्धि और तर्क (50 प्रश्न)
परीक्षण (ii) : सामान्य जानकारी (50 प्रश्न)
परीक्षण (iii) : भाग - क : सामान्य इंजीनियरी (100 प्रश्न)
(सिविल एवं संरचनात्मक)
अथवा
भाग - ख : सामान्य इंजीनियरी (100 प्रश्न)
(विद्युत)
अथवा
भाग - ग : सामान्य इंजीनियरी (100 प्रश्न)
(यांत्रिक)
- अंग्रेजी और हिन्दी भाषा में तैयार किए गए द्विभाषी प्रश्नों में कोई विषमता होने की स्थिति में अंग्रेजी विवरण मान्य होगा।
- परीक्षण-I सामान्य बुद्धि और तर्क एवं परीक्षण-II सामान्य जानकारी सभी उम्मीदवारों के लिए अनिवार्य है। उम्मीदवारों को आवेदन-पत्र में दिए विकल्प के अनुसार परीक्षण-III सामान्य इंजीनियरी का केवल एक ही भाग-क सिविल एवं संरचनात्मक अथवा भाग-ख विद्युत अथवा भाग-ग यांत्रिक को हल करना होगा अन्यथा आपको 'शून्य' अंक दिया जाएगा।
- सभी प्रश्न अनिवार्य हैं तथा सबके बराबर अंक हैं।
- प्रश्न पत्र में नकारात्मक अंकन होगा। हर गलत उत्तर के लिए 0.25 अंक काटा जाएगा।
- प्रश्नों के उत्तर देने से पहले आप इस पुस्तिका की जांच करके देख लें कि इसमें पूरे पृष्ठ (1-80) हैं तथा कोई पृष्ठ कम या दुबारा तो नहीं आ गया है। यदि आप इस पुस्तिका में कोई त्रुटि पाएँ, तो तत्काल इसके बदले दूसरी पुस्तिका ले लें।
- निरीक्षक द्वारा आपको उत्तर-पत्रिका अलग से दी जाएगी। प्रश्नों के उत्तर वास्तव में शुरू करने से पहले आप उत्तर-पत्रिका के Side-I में नियमावली के अनुसार अपना नाम, रोल नम्बर, टिकट नम्बर, परीक्षा का नाम जैसे प्रवेश पत्र में दिखाया गया है, जन्म तिथि, टेस्ट फॉर्म संख्या तथा विषय अर्थात् सिविल एवं संरचनात्मक या विद्युत या यांत्रिक आदि अवश्य लिखें। प्रश्नों के उत्तर देने से पहले उत्तर-पत्रिका पर निर्धारित स्थान में आप अपने हस्ताक्षर एवं बाएँ हाथ के अंगूठे का निशान भी अवश्य लगाएँ। उपर्युक्त अनुदेशों का पूरी तरह अनुपालन किया जाए अन्यथा आपकी उत्तर-पत्रिका को जांचा नहीं जाएगा और 'शून्य' अंक दिया जाएगा।
- उत्तर-पत्रिका में सभी उत्तर Side-II में प्रश्न संख्या के सामने दिये गये सम्बन्धित अण्डाकार खानों को केवल काला/नीला बॉल-पॉइंट पेन से पूरी तरह काला करके दिखाएँ। जो अण्डाकार खाने काला/नीला बॉल-पॉइंट पेन से नहीं भरे जाएँ, उनके लिए कोई अंक नहीं दिया जाएगा।
- ओ.एम.आर. उत्तर-पत्रिका में भरी गई कूट सूचना को एक मशीन पढ़ेगी। यदि सूचना अपूर्ण है अथवा आवेदन प्रपत्र में दी गई सूचना से भिन्न है, तो ऐसे अभ्यर्थी को 'शून्य' अंक दिया जाएगा।
- परीक्षा-भवन छोड़ने से पहले परीक्षार्थी को उत्तर-पत्रिका निरीक्षक के हवाले कर देनी चाहिए।
- ऊपर के अनुदेशों में से किसी एक का भी पालन न करने पर उम्मीदवार पर विवेकानुसार कार्यवाही की जा सकती है या दण्ड दिया जा सकता है।
- विभिन्न प्रश्नों के उत्तर देने की विधि इस पुस्तिका के पीछे (पृष्ठ संख्या 80) में छपे हुए निर्देशों में दे दी गई है, इसे आप प्रश्नों के उत्तर देने से पहले ध्यानपूर्वक पढ़ लें।
- प्रश्नों के उत्तर जितनी जल्दी हो सके तथा ध्यानपूर्वक दें। कुछ प्रश्न आसान तथा कुछ कठिन हैं। किसी एक प्रश्न पर बहुत अधिक समय न लगाएँ।
- कोई रफ़ कार्य उत्तर-पत्रिका पर नहीं करना है। रफ़ कार्य के लिए स्थान प्रश्नों के नीचे दिया गया है।
- परीक्षा हॉल/कमरा में मोबाइल फोन तथा बेतार संचार साधन पूरी तरह निषिद्ध हैं। उम्मीदवारों को उनके अपने हित में सलाह दी जाती है कि मोबाइल फोन/किसी अन्य बेतार संचार साधन को स्विच ऑफ़ करके भी अपने पास न रखें। इस प्रावधान का अनुपालन न करने को परीक्षा में अनुचित उपायों का प्रयोग माना जाएगा और उनके विरुद्ध कार्रवाई की जाएगी, उनकी अभ्यर्थिता रद्द कर देने सहित।"

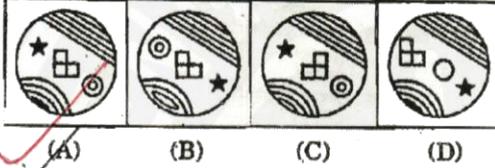
TEST (i) : GENERAL INTELLIGENCE AND REASONING

Directions : In questions no. 1 to 9, select the related figure/letters/number from the given alternatives.

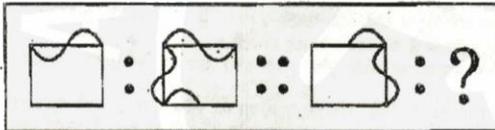
1. Question figures :



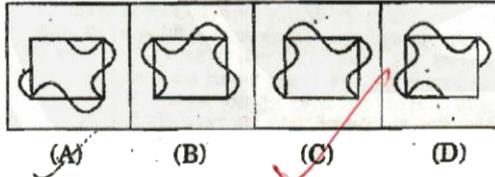
Answer figures :



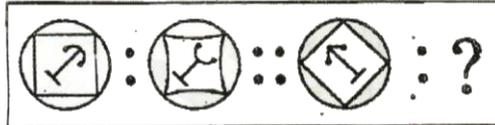
2. Question figures :



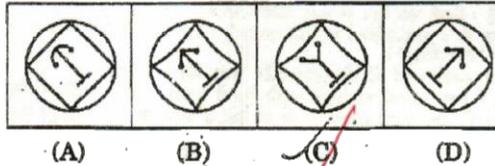
Answer figures :



3. Question figures :



Answer figures :



4. BADC : XWZY :: FEHG : ?
 (A) VXRT (B) TSVU
 (C) YXCV (D) VSKW

5. $\frac{5}{9} : \frac{7}{13} :: \frac{10}{19} : ?$
 (A) $\frac{14}{26}$ (B) $\frac{14}{27}$
 (C) $\frac{14}{23}$ (D) $\frac{14}{25}$

6. 3 : 9 :: 6 : ?
 (A) 14 (B) 18
 (C) 17 (D) 16

7. $23^5 : 8 :: 32^5 : ?$
 (A) 6 (B) 9
 (C) 17 (D) 27

8. MLKJ : NOPQ :: IHGF : ?
 (A) UTSR (B) RSTU
 (C) SRUT (D) UTRS

9. ACEG : ZXVT :: BDFH : ?
 (A) YWUS (B) YXWV
 (C) YWVT (D) YXVW

Directions : In questions no. 10 to 18, select the one which is different from the other three responses.

10. (A) Tagore (B) Raman
 (C) Bhaskara (D) Khurana

11. (A) 17 - 142 (B) 71 - 34
 (C) 41 - 28 (D) 14 - 28

12. (A) 3, 5, 7, 9 (B) 5, 7, 9, 11
 (C) 4, 6, 8, 10 (D) 2, 5, 9, 10

13. (A) 8662 (B) 5731
 (C) 4628 (D) 2864

14. (A) Mars (B) ~~Jupiter~~
(C) Earth (D) ~~Comet~~
15. (A) Geeta (B) Quran
(C) Bible (D) ~~Mahabharat~~
16. (A) Message (B) Information
(C) Matter (D) ~~Material~~
17. (A) Guitar (B) Veena
(C) ~~Flute~~ (D) Sitar
18. (A) ~~7-145~~ (B) ~~6-108~~
(C) ~~5-75~~ (D) ~~4-48~~

19. Which will appear fourth in the dictionary?

- (A) Xylophilous
(B) Xylophagus
(C) ~~Xylopyrography~~
(D) ~~Xylophagan~~

20. Number of letters skipped in between adjacent letters in the series increases by one. Which of the following series observes the rule given below?

- (A) ~~BEIN~~ (B) CDJO
(C) GJLS (D) ~~QUNZ~~

21. In the following words, the group of letters should not contain more than three vowels. Which of the following words does not conform to the rule?

- (A) SCARCITY
(B) PROGNOSIS
(C) ~~COMPLEXITY~~
(D) ~~CONVULSION~~

22. Arrange the following words in a meaningful order:

1. Grapes 2. Vineyard
3. Whisky 4. Brewing

5. Distillation

- (A) 2, 1, 5, 4, 3
(B) 3, 5, 4, 2, 1
(C) 2, 1, 4, 3, 5
(D) ~~2, 1, 4, 5, 3~~

Directions : In questions no. 23 to 26, choose the correct alternative from the given responses that will complete the series.

23. 78, 86, ⁸?, ⁶88, ⁸82, 90

- (A) 76 (B) 84
(C) 83 (D) ~~80~~

24. ²3 7 ⁴13 ⁸? ¹⁶31 ³²43 ⁶⁴57

- (A) 51 (B) 81
(C) 41 (D) ~~21~~

25. EJOT, INSX, AFKP, ?

- (A) CHMS (B) XTOJ
(C) ~~BGLQ~~ (D) ~~EJOT~~

26. ¹?, PSV, EHK, TWZ, ILO

- (A) BEH (B) IMP
(C) ACG (D) ~~ADG~~

27. A car covers the first half of the distance between two places at 40 km/hr and the second half of the distance at 60 km/hr. So what is the average speed of the car?

- (A) 45 km/hr (B) ~~48 km/hr~~
(C) 50 km/hr (D) 60 km/hr

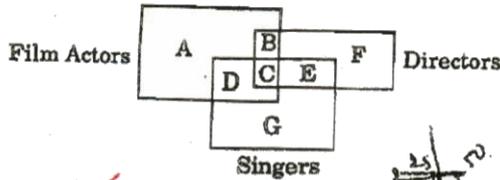
28. My father has two brothers. The youngest has two sons and one daughter. The elder one has one son and two daughters and the remaining one has three sons. If my father has four nephews, how many cousins (brothers) have I got?

- (A) 6 (B) ~~4~~
(C) 7 (D) 5

29. Find the wrong number in the given series.

- 3, 7, 15, 31, ~~64~~, 127
(A) 127 (B) ~~64~~
(C) 31 (D) 3

40. In the following Venn diagram, identify the letter which denotes Film Actors who are Singers but not Directors.

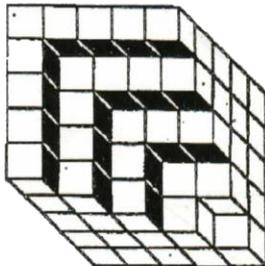


- (A) D
(B) C
(C) E
(D) F

41. The door of Priya's house faces East. From the back side of the house, she walks straight 50 meters, then turns to the right and walks 50 meters again. Finally, she turns towards the left and stops after walking 25 meters. Now Priya is facing which direction?
(A) North (B) West
(C) East (D) South

42. Ram travelled 6 ft towards West, he turned left and walked 8 ft, then turned left and walked 4 ft, then turned left and walked 8 ft again. How far is he now from the starting point?
(A) 8 ft (B) 6 ft
(C) 4 ft (D) 2 ft

43. How many black-faced cubes are there in the given structure?



- (A) 75 (B) 55
(C) 25 (D) 15

Directions : In questions no. 44 and 45, one or two statements are given, followed by two conclusions I and II. You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You have to decide which of the given conclusions, if any, follows from the given statements.

44. Statements :
All scientists are hard-working. No hard-working man is poor.

Conclusions :

- I. No scientist is poor.
II. No poor man is a scientist.

- (A) Only conclusion I follows
(B) Only conclusion II follows
(C) Both conclusions I and II follow
(D) None of the conclusions I or II follows

45. Statement :

A social movement is an interaction of people with a common motivational base in frustration.

Conclusions :

- I. In a social movement, people who are satisfied interact with frustrated people.
II. Frustrated people interact with each other in a social movement.

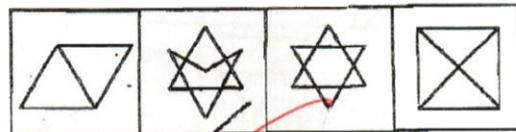
- (A) Only conclusion I follows
(B) Only conclusion II follows
(C) Neither conclusion I nor II follows
(D) Both conclusions I and II follow

46. Select the answer figure in which the question figure is hidden/embedded.

Question figure :



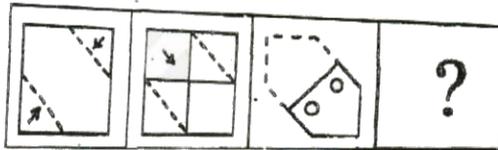
Answer figures :



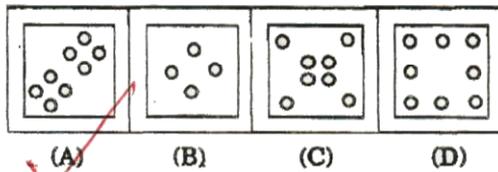
- (A) (B) (C) (D)

47. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened ?

Question figures :



Answer figures :

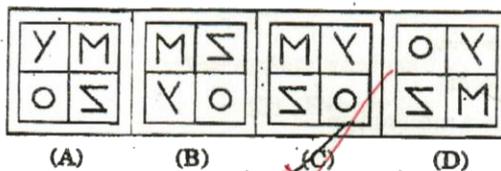


48. Which of the answer figures is exactly the mirror image of the given figure, when the mirror is held on the line AB ?

Question figures :



Answer figures :



49. A word is represented by only one set of numbers as given in any one of the alternatives: The sets of numbers given in the alternatives are represented by two classes of alphabets as in the two matrices given below. The columns and rows of Matrix I are numbered from 0 to 4 and that of Matrix II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, e.g. 'A' can be represented by 13, 76, etc., and 'G' can be represented by 22, 65, etc. Similarly, you have to identify the set for the word 'PUBLIC'.

Matrix I

	0	1	2	3	4
0	A	U	O	T	B
1	T	E	P	A	W
2	R	M	G	G	I
3	U	M	M	C	L
4	P	L	N	E	C

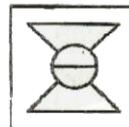
Matrix II

	5	6	7	8	9
5	P	T	A	M	E
6	G	I	O	T	M
7	E	A	L	T	M
8	R	A	B	L	T
9	N	P	E	G	P

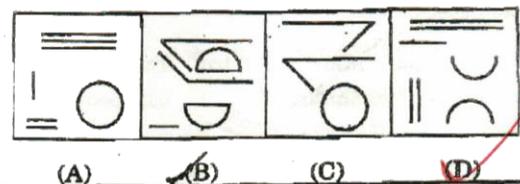
- (A) 12, 30, 87, 41, 66, 33
 (B) 99, 30, 87, 77, 23, 44
 (C) 55, 01, 87, 98, 34, 87
 (D) 40, 30, 87, 89, 24, 43

50. Components of which of the answer figures will exactly make up the question figure given below.

Question figure :



Answer figures :



TEST (ii) : GENERAL AWARENESS

51. A civil servant in India may exercise political liberty by
 (A) joining any political party
 (B) contesting in the elections
 (C) criticizing the government
 (D) exercising his franchise
52. The term 'Law' used in the phrase 'Rule of Law' refers to
 (A) Positive law
 (B) Natural law
 (C) Common law
 (D) Conventions of the Constitution
53. The total physical product per unit of a variable input is known as
 (A) Average product
 (B) Average returns
 (C) Average physical product
 (D) Average revenue
54. The discount on price when a large quantity is purchased is known as
 (A) Volume discount
 (B) Maximum discount
 (C) Minimum discount
 (D) Marginal discount
55. The characteristic feature of democratic socialism is
 (A) Privatization (B) Liberalization
 (C) Nationalization (D) Socialization
56. If a group of rich people use power for their selfish goals, it is called as
 (A) Monarchy
 (B) Oligarchy
 (C) Polity
 (D) Democracy
57. Who said that "Man is born free and everywhere he is in chains" ?
 (A) Locke (B) Aristotle
 (C) Marx (D) Rousseau
58. The main reason for the high growth of money supply in India since 1970 has been the rise in
 (A) Foreign lending
 (B) Foreign borrowing
 (C) RBI credit to the government
 (D) Bank credit to the private sector
59. Who was the first Muslim to be elected as President of the Indian National Congress ?
 (A) Syed Ahmad Khan
 (B) Agha Khan
 (C) Muhammad Ali Jinnah
 (D) Badruddin Tyabji
60. Which of the following was *not* known to the Rigvedic period ?
 (A) Joint family system
 (B) Agriculture
 (C) Marriage system
 (D) Varna system
61. Who was the first economist to have coined the terms "Micro Economics" and "Macro Economics" ?
 (A) Milton Friedman
 (B) Ragnar Frisch
 (C) J.M. Keynes
 (D) Paul Samuelson
62. In a free enterprise economy, the decision on what shall be produced is made by
 (A) Demand
 (B) Income
 (C) Price mechanism
 (D) Cost

63. Hurricanes are generally
 (A) active over the land
 (B) travelling in families
 (C) dust storms
 (D) active over the sea
64. Orinoco oil belt is in
 (A) Dubai (B) Saudi Arabia
 (C) Venezuela (D) Brazil
65. The highest peak in Africa is
 (A) Aconcagua
 (B) Kilimanjaro
 (C) McKinley
 (D) Mount Elbrus
66. A layer of the Earth made up of mixed metals and silicates is called
 (A) Sial (B) Sima
 (C) Mantle (D) Nife
67. The exhaustion of soil fertility is the result of
 (A) Cover cropping
 (B) Multiple cropping
 (C) Rotation cropping
 (D) Over cropping
68. The first Muslim king who invaded South India was
 (A) Balban
 (B) Mohammad bin Tughlaq
 (C) Babur
 (D) Alauddin Khilji
69. The Great Bath was located in
 (A) Harappa (B) Mohenjodaro
 (C) Lothal (D) Kalibangan
70. The Mughal judicial system was based on
 (A) Persian law (B) Hebrew law
 (C) Islamic law (D) Indian law
71. The number of occipital condyles in man is
 (A) One (B) Two
 (C) Three (D) Four
72. Migratory larvae of *Ascaris* produce symptoms of pneumonia. This is known as
 (A) Down's syndrome
 (B) Klinefelter's syndrome
 (C) Turner's syndrome
 (D) Loeffler's syndrome
73. Which one of the following animals is an osmoconformer?
 (A) Hagfish (B) Seal
 (C) Whale (D) Rohu
74. Which one of the following is the source of Solar energy?
 (A) Nuclear fission
 (B) Nuclear fusion
 (C) Artificial radioactivity
 (D) X-ray emission
75. Who, for the first time, successfully determined the charge of an electron?
 (A) Thomson (B) Millikan
 (C) Rutherford (D) Coulomb
76. What type of fruit is pineapple?
 (A) Siliqua (B) Sorosis
 (C) Syconus (D) Samara
77. Strobilus is a structure associated with
 (A) Pea (B) Potato
 (C) Pinus (D) Palm
78. Signet-ring is seen in the life cycle of
 (A) Mosquito (B) Plasmodium
 (C) Entamoeba (D) Giardia

79. Pick the odd one out. 79.
- (A) Compiler
(B) Interpreter
(C) Assembler
(D) Word processor
80. MS-Office is an example of _____ 80.
- (A) an operating system
(B) a telecommunication software
(C) a programming language
(D) a productivity software
81. In India, the day 5th September is celebrated as Teacher's Day to honour the birthday of 81.
- (A) Rabindra Nath Tagore
(B) Dr. S. Radhakrishnan
(C) Dr. Rajendra Prasad
(D) Mrs. Indira Gandhi
82. Which among the following polluting agents is responsible for creating a hole in the ozone layer? 82.
- (A) CO ~~(B) CFC~~
(C) SO₂ (D) CH₄
83. The 'solder' used for connecting electronic circuits consists of 83.
- ~~(A) Lead and Tin~~
(B) Tin and Iron
(C) Copper and Lead
(D) Lead and Aluminium
84. What type of molecular motion is responsible for heat conduction? 84.
- ~~(A) Translational~~
(B) Vibrational
(C) Rotational
(D) Spin
85. When and where will the next Olympics be held? 79.
- (A) Beijing, 2014
(B) Shanghai, 2012
~~(C) Rio-de-Janeiro, 2016~~
(D) Taiwan, 2013
86. A Persian form of singing a poem is called 80.
- ~~(A) Ghazal~~ ~~(B) Qawali~~
(C) Thumri (D) Bhajan
87. Green-house effect causes 81.
- ~~(A) increase of temperature~~
(B) increase of moisture in air
(C) decrease of temperature
(D) decrease of moisture in air
88. The advantage of rain-water harvesting is that it 82.
- (A) helps in reducing floods
(B) increases the ground water level
(C) causes more rains
~~(D) reduces floods and replenishes ground water~~
89. Injection of weakened microbes to confer resistance to a disease is known as 83.
- (A) Transfusion
~~(B) Vaccination~~
(C) Inoculation
(D) Intimation
90. Who, among the following, is the author of 'Das-Kapital'? 84.
- (A) Rousseau
~~(B) Karl Marx~~
(C) Chanakya
(D) Montesquieu

91. The major constituent of air is
 (A) Nitrogen
(B) Carbon dioxide
(C) Oxygen
(D) Hydrogen
92. The souring of milk to curd is an example of
(A) Saponification
(B) Putrefaction
 (C) Fermentation
 (D) Esterification
93. Which one of the following compounds is formed when formaldehyde is treated with Grignard reagent?
 (A) Primary alcohol
(B) Secondary alcohol
(C) Tertiary alcohol
(D) Dihydric alcohol
94. Volvo, the car manufacturing company, introduced
(A) Alarm
(B) Fog light
 (C) Seat belts
(D) Rear view mirrors
95. The Dark Continent is
(A) Asia
(B) Australia
 (C) Africa
(D) Europe
96. Which of the following is *not* a water treatment technique?
(A) Reverse osmosis
 (B) Ion exchange
(C) Electro-dialysis
 (D) Electrostatic precipitation
97. Which one of the following is a major indoor air pollutant in India?
(A) Ozone
(B) Peroxy Acetyl Nitrite (PAN)
 (C) Carbon monoxide
(D) Sulphur dioxide
98. Multi Drug Therapy is for the infection of
 (A) Leprosy
(B) AIDS
(C) Cholera
(D) Hepatitis
99. Fly ash is
(A) CO₂
(B) Organic particulate matter
 (C) Small ash particles
(D) NO_x
100. Addition of chlorine to raw water before treatment is known as
(A) Plain chlorination
(B) Post-chlorination
 (C) Pre-chlorination
(D) Super-chlorination

TEST (iii)
PART - A : GENERAL ENGINEERING
(CIVIL AND STRUCTURAL)

101. The crushing strength of a first class brick is
 (A) 3 N/mm² (B) 5.5 N/mm²
 (C) 10.5 N/mm² (D) 7.5 N/mm²
102. Which of the following cements is suitable for use in urgent repairs of existing massive concrete structures such as large dams ?
 (A) Ordinary portland cement
 (B) Low heat cement
 (C) Rapid hardening cement
 (D) Sulphate resisting cement
103. For polishing mosaic floors we use
 (A) Carbolic acid (B) Muriatic acid
 (C) Acetic acid (D) Oxalic acid
104. The lintels are preferred to arches because
 (A) arches require more headroom to span the openings like doors, windows, etc.
 (B) arches require strong abutments to withstand arch thrust
 (C) arches are difficult in construction
 (D) All of the above
105. The most suitable stone for building piers is
 (A) granite (B) limestone
 (C) marble (D) sandstone
106. Number of modular bricks required for one cubic metre of brick masonry are
 (A) 400 (B) 450
 (C) 550 (D) 500
107. The plasticity to mould bricks in suitable shape is contributed by
 (A) Alumina (B) Lime
 (C) Magnesia (D) Silica
108. Gypsum used in cement manufacturing acts as
 (A) accelerator
 (B) air entraining agent
 (C) plasticizer
 (D) retarder
109. The woodworks should be measured to nearest
 (A) 0.001 m
 (B) 0.002 m
 (C) 0.003 m
 (D) 0.004 m
110. Anti-siphonage pipe is connected to
 (A) Main soil pipe
 (B) Bottom of P trap W.C.
 (C) Top of P trap W.C.
 (D) Side of Water Closet
111. For 15 mm thick cement plastering 1 : 6 on 100 sq.m. new brick work, the quantity of cement required is
 (A) 0.200 m³ (B) 0.247 m³
 (C) 0.274 m³ (D) 0.343 m³
112. The base material for distemper is
 (A) Chalk
 (B) Lime
 (C) Clay
 (D) Lime putty
113. The amount of water used in performing setting time test of cement is (assuming p = standard consistency of cement)
 (A) 0.60 p (B) 0.65 p
 (C) 0.80 p (D) 0.85 p

320
287

114. If d be the diameter of MS or tor steel bars in mm, the standard weight (in kg) per metre of the bar is
- (A) $0.00618 d^2$
 - (B) $0.00618 d$
 - (C) $0.00816 d^2$
 - (D) $0.00816 d$

115. The main principle of field surveying is to work from
- (A) higher level to lower level
 - (B) lower level to higher level
 - (C) part to whole
 - (D) whole to part

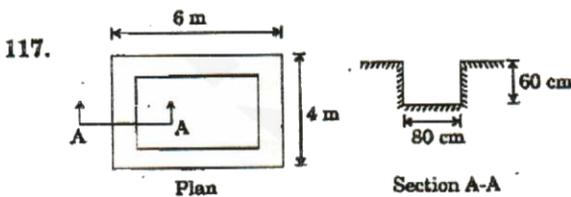
116. If 'i' is the rate of interest expressed in decimal and 'n' is the number of years, then coefficient of annual sinking fund, I_c is

(A) $I_c = \frac{[(1+i)^n - 1]}{(1+i) - 1}$

(B) $I_c = \frac{i}{(1+i)^n - 1}$

(C) $I_c = \frac{i}{(1-i)^n + 1}$

(D) $I_c = \frac{i}{(1+i)^n + 1}$



The above figure represents plan and section of an excavation layout. The volume of earthwork in excavation of foundation trench is

- (A) 6.528 cu.m.
- (B) 8.064 cu.m.
- (C) 8.832 cu.m.
- (D) 9.600 cu.m.

118. The Whole Circle Bearing of a line is $287^\circ 15'$. The Reduced Bearing of the line is

- (A) S $107^\circ 15'$ W
- (B) S $17^\circ 15'$ W
- (C) N $72^\circ 45'$ W
- (D) S $107^\circ 15'$ E

119. A line joining some fixed points on the main survey lines is called

- (A) check line
- (B) tie line
- (C) chain line
- (D) base line

120. Which of the following methods of contouring is most suitable for hilly terrain?

- (A) Direct method
- (B) Square method
- (C) Cross-section method
- (D) Tacheometric method

121. A level line is a

- (A) line parallel to the mean spheroidal surface of the earth
- (B) line passing through centre of cross hairs and centre of eye-piece
- (C) line passing through objective lens and the eye-piece
- (D) horizontal line

122. Ranging is defined as

- (A) measuring the distance from starting point
- (B) establishing intermediate points on a chain line
- (C) the distance between end points
- (D) a point on a chain line

123. Compute the angle between the lines AB and AC, If their respective bearings are $52^\circ 30'$ and $328^\circ 45'$.

- (A) $276^\circ 15'$
- (B) $6^\circ 15'$
- (C) $111^\circ 15'$
- (D) $83^\circ 45'$

124. If the sum of northings of a traverse exceeds the sum of southings by 1 m and sum of eastings exceeds the sum of westings by 1 m, the resultant closing error and its true bearing are respectively,
- (A) $\sqrt{2}$ m, N 45° E
 (B) 1 m, N 45° E
 (C) 2 m, N 45° W
 (D) 2 m, N 45° E
125. If in a closed traverse, the sum of the north latitudes is more than the sum of the south latitudes and also the sum of west departures is more than the sum of east departures, the bearing of the closing line is in the
- (A) SE quadrant
 (B) NE quadrant
 (C) NW quadrant
 (D) SW quadrant
126. The angle between true meridian and the magnetic meridian at the time of observations is known as
- (A) Orientation
 (B) Magnetic declination
 (C) Magnetic bearing
 (D) Dip
127. 'Offsets' are
- (A) Lateral measurements from chain line
 (B) Ties or check lines which are perpendicular to chain line
 (C) Sets of minor measurements in chain surveying
 (D) Chain lines which go out of alignment
128. The fore bearings of the lines AB and BC are 40° and 120° respectively. The included angle between AB and BC is
- (A) 40° (B) 60°
 (C) 80° (D) 100°
129. If the volume of voids is equal to the volume of solids in a soil mass, then the values of porosity and voids ratio respectively are
- (A) 1.0 and 0.0 (B) 0.0 and 1.0
 (C) 1.5 and 1.0 (D) 1.0 and 0.5
130. The lime stabilization is very effective in treating
- (A) Sandy soils
 (B) Silty soils
 (C) Non-plastic soils
 (D) Plastic clayey soils
131. A 300 mm square bearing plate settles by 15 mm in a plate load test on a cohesive soil when the intensity of loading is 0.2 N/mm². The settlement of a prototype shallow footing 1 m square under the same intensity of loading is
- (A) 15 mm (B) 30 mm
 (C) 50 mm (D) 167 mm
132. The specific speed for a turbine has the dimensions of
- (A) $F^{1/2} L^{-3/4} T^{-3/2}$
 (B) T^{-1}
 (C) $F^{1/2} L^{-5/2} T^{-3/2}$
 (D) $F L^{-3/4} T^{-3/2}$
133. Sand particles are made of
- (A) Kaolinite
 (B) Illite
 (C) Montmorillonite
 (D) Quartz
134. A shallow foundation is defined as a foundation which
- (A) has low bearing capacity
 (B) has a depth of embedment less than its width
 (C) is resting on the ground surface
 (D) causes less settlement

135. The discharge over a rectangular notch is
 (A) inversely proportional to $H^{3/2}$
 (B) directly proportional to $H^{3/2}$
 (C) inversely proportional to $H^{5/2}$
 (D) directly proportional to $H^{5/2}$
136. The most economical section of a rectangular channel is one having hydraulic radius equal to
 (A) twice the depth
 (B) half the breadth
 (C) half the depth
 (D) twice the breadth
137. In a rectangular channel, the ratio of the specific energy at critical depth E_c to the critical depth y_c is
 (A) 2.0 (B) 1.0
 (C) 1.5 (D) 1.25
138. In open channel flows, the characteristic length commonly used in defining the Reynolds number is the
 (A) depth of flow
 (B) wetted perimeter
 (C) hydraulic radius
 (D) area/top width
139. Bulk modulus of a fluid is the ratio of
 (A) shear stress to shear strain
 (B) increase in volume to the viscosity of fluid
 (C) increase in pressure to the volumetric strain
 (D) critical velocity to the velocity of fluid
140. The buoyancy depends upon the
 (A) pressure with which the liquid is displaced
 (B) weight of the liquid displaced
 (C) viscosity of the liquid
 (D) compressibility of the liquid
141. Reynolds number is the ratio of the inertia force to the
 (A) surface tension force
 (B) viscous force
 (C) gravity force
 (D) elastic force
142. A river training work is generally required when the river is
 (A) aggrading type
 (B) meandering type
 (C) degrading type
 (D) both (A) and (C)
143. The water utilizable by plants is available in the form of
 (A) gravity water
 (B) hydroscopic water
 (C) capillary water
 (D) chemical water
144. A surge tank is provided in hydropower schemes to
 (A) reduce water hammer pressures
 (B) reduce frictional losses
 (C) increase the net head
 (D) strengthen the penstocks
145. In a two-dimensional flow of fluid, if a velocity potential function ϕ exists which satisfies the relation

$$\frac{\partial^2 \phi}{\partial x^2} + \frac{\partial^2 \phi}{\partial y^2} = 0$$
, then the flow is
 (A) steady incompressible
 (B) steady laminar and incompressible
 (C) irrotational and incompressible
 (D) turbulent and incompressible

146. The permissible limit of arsenic in drinking water as per the guidelines of WHO is
 (A) 0.01 ppm
 (B) 0.01 ppb
 (C) 0.05 ppm
 (D) 0.05 ppb
147. Which one of the following sequences is the most suitable for treating raw surface water to make it suitable for drinking purpose?
 (A) Screening → filtration → sedimentation → disinfection
 (B) Screening → disinfection → sedimentation → filtration
 (C) Screening → sedimentation → disinfection → filtration
 (D) Screening → sedimentation → filtration → disinfection
148. The populations of a town as per census records were 200000, 210000 and 230000 for the years 1981, 1991 and 2001 respectively. The population of the town as per geometric mean method in the year 2009 is
 (A) 244872
 (B) 245872
 (C) 246820
 (D) None of the above
149. If the stopping distance and average length of a vehicle are 18 m and 6 m respectively, then the theoretical maximum capacity (vehicles per hour) of a traffic lane at a speed of 10 m/sec is
 (A) 1500
 (B) 2000
 (C) 2500
 (D) 3000
150. In highway construction on superelevated curves, the rolling shall proceed from
 (A) sides towards the centre
 (B) centre towards the sides
 (C) lower edge towards the upper edge
 (D) upper edge towards the lower edge
151. From a circular plate of diameter 6.0 cm, a circle is cut out whose diameter is a radius of the plate. The distance of centre of gravity of the remainder from the centre of circular plate is
 (A) 2.0 cm
 (B) 1.5 cm
 (C) 1.0 cm
 (D) 0.5 cm
152. In a section undergoing pure bending, the neutral surface is subjected to
 (A) compression strain
 (B) tensile strain
 (C) zero strain
 (D) None of the above
153. The ability of a material to absorb energy till the breaking or rupture takes place is known as
 (A) Hardness
 (B) Toughness
 (C) Brittleness
 (D) Softness
154. At the point of contraflexure
 (A) Bending moment is minimum
 (B) Bending moment is maximum
 (C) Bending moment is zero
 (D) Bending moment is zero and its sign changes
155. A beam fixed at both ends carries a uniformly distributed load on entire length. The ratio of bending moment at the support to the bending moment at mid span is given by
 (A) 0.5
 (B) 1.0
 (C) 1.5
 (D) 2.0
156. In case of biaxial stress, the maximum value of shear stress is given by
 (A) Difference of the normal stresses
 (B) Half the difference of the normal stresses
 (C) Sum of the normal stresses
 (D) Half the sum of the normal stresses

157. Of the several prismatic beams of equal lengths and of same material, the beam that can carry maximum load in flexure is the one having maximum

- (A) Depth of section
- (B) Area of cross-section
- (C) Section modulus
- (D) Moment of inertia

158. The maximum deflection of a simply supported beam of effective span L and subjected to a central concentrated load W is given by

- (A) $WL^3/8 EI$
- (B) $WL^3/24 EI$
- (C) $WL^3/48 EI$
- (D) $5 WL^3/384 EI$

159. A concentrated load W acts at the centre of a simply supported beam of length L . If the load is changed to a uniformly distributed load over the entire span, then the ratio of maximum deflection under concentrated load and under uniformly distributed load will be

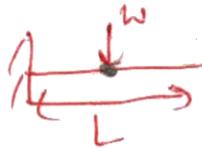
- (A) 1:2
- (B) 1:3
- (C) 1/4
- (D) 8/5

160. The shear diagram for a cantilever beam subjected to a concentrated load at the free end is given by a/an

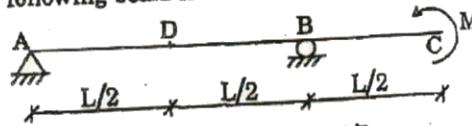
- (A) Triangle
- (B) Rectangle
- (C) Parabola
- (D) Ellipse

161. Deflection of the free end of a cantilever beam having a concentrated load W at mid span is given by

- (A) $WL^3/3 EI$
- (B) $5 WL^3/24 EI$
- (C) $5 WL^3/48 EI$
- (D) $WL^3/48 EI$



162. Shear force at the mid-span point D in the following beam is



- (A) zero
- (B) $2 M/L$
- (C) M/L
- (D) $3 M/L$

163. Two identical simply supported beams of span 'l' are subjected to equal load 'W'. One beam is carrying the load 'W' at its centre (as concentrated load) and the other one is carrying it in the form of u.d.l. over the entire span. The ratio of their mid-span bending moment will be

- (A) $\frac{1}{2}$
- (B) 2
- (C) 4
- (D) 8

164. In a Mohr's circle of $\sigma - \tau$ plane ($\sigma =$ normal stress, $\tau =$ shear stress), the vertical diameter represents

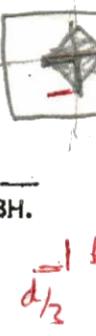
- (A) Maximum shear stress
- (B) Maximum normal stress
- (C) Principal stress
- (D) Minimum normal stress

165. A simply supported beam is carrying distributed load of 'zero' intensity over one support to linearly varying nature of intensity 'w' over the other support. The shape of BMD will be

- (A) linear
- (B) parabolic
- (C) cubical parabolic
- (D) zero

166. The maximum dimension of a core section for a rectangular cross-section under eccentric loading on a column ($b \times d$) is

- (A) $b/6$
- (B) $d/6$
- (C) $d/8$
- (D) $b/3$ and $d/3$



167. The moment required to rotate the near end of a prismatic beam through unit angle, without translation, the far end being fixed is
 (A) EI/L (B) $2EI/L$
 (C) $3EI/L$ (D) $4EI/L$
168. A retaining wall of trapezoidal section having base width 'b' retains earth at its back. For no tension to be developed at base, the resultant force will intersect the base from centre line of the base, within a distance of
 (A) $b/3$ (B) $b/4$
 (C) $b/5$ (D) $b/6$
169. Angle of twist of a circular shaft under the action of a torsional moment T is given by
 (A) GJ/TL (B) TL/GJ
 (C) TJ/GL (D) TG/JL
170. A structure which offers negligible or zero resistance on bending at any point is known as
 (A) Beam
 (B) Girder
 (C) Lintel
 (D) Cable
171. The curvature at any point $\left(\frac{1}{R}\right)$ along the curve representing the deformed shape of a beam is given by
 (A) $\pm(dy/dx) / \left[1 + \frac{d^2y}{dx^2}\right]^{1/2}$
 (B) $\pm(d^2y/dx^2) / \left[1 + \left(\frac{dy}{dx}\right)^2\right]^{3/2}$
 (C) $\pm(d^2y/dx^2) / \left[1 + \frac{d^2y}{dx^2}\right]^{1/2}$
 (D) $\pm(dy/dx) / \left[1 + \frac{d^2y}{dx^2}\right]^2$
172. Poisson's ratio μ is defined as the ratio of
 (A) axial strain to transverse strain
 (B) axial strain to shear strain
 (C) transverse strain to axial strain
 (D) shear strain to axial strain
173. In a thin cylindrical shell, the ratio of longitudinal stress to hoop stress is
 (A) 0.5 (B) 1.0
 (C) 1.5 (D) 2.0
174. The grade of concrete M 20 means that characteristic compressive strength of 15 cm cubes after 28 days is given by
 (A) 10 N/mm^2 (B) 15 N/mm^2
 (C) 20 N/mm^2 (D) 25 N/mm^2
175. You are asked to construct a massive concrete dam. The type of cement you will use is
 (A) Ordinary portland cement
 (B) Rapid hardening portland cement
 (C) Low heat cement
 (D) Blast furnace slag cement
176. The object of curing is *not* to
 (A) prevent the loss of water by evaporation
 (B) reduce the shrinkage of cement concrete
 (C) preserve the properties of concrete
 (D) reduce the strength of concrete
177. The initial setting time of Ordinary Portland Cement (OPC) is
 (A) 10 min. (B) 30 min.
 (C) 45 min. (D) 60 min.
178. The equivalent stiffness of two springs of stiffness S_1 and S_2 joined in series is given by
 $S =$
 (A) $S_1 S_2 / (S_1 + S_2)$
 (B) $(S_1/S_2) / (S_1 + S_2)$
 (C) $S_1 + S_2$
 (D) $S_1 S_2$
179. Buckling load for an axially loaded column with both ends fixed is given by
 (A) $\pi^2 EI/l^2$ (B) $2\pi^2 EI/l^2$
 (C) $4\pi^2 EI/l^2$ (D) $\pi^2 EI/(4l^2)$

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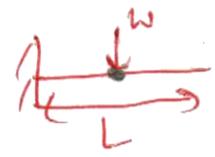
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- (D) 8/5

160. The shear diagram for a cantilever beam subjected to a concentrated load at the free end is given by a/an

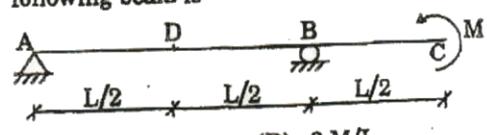
- (A) Triangle
- (B) Rectangle
- (C) Parabola
- (D) Ellipse

161. Deflection of the free end of a cantilever beam having a concentrated load W at mid span is given by

- (A) $WL^3/3 EI$
- (B) $5 WL^3/24 EI$
- (C) $5 WL^3/48 EI$
- (D) $WL^3/48 EI$



162. Shear force at the mid-span point D in the following beam is



- (A) zero
- (B) $2 M/L$
- (C) M/L
- (D) $3 M/L$

163. Two identical simply supported beams of span 'l' are subjected to equal load 'W'. One beam is carrying the load 'W' at its centre (as concentrated load) and the other one is carrying it in the form of u.d.l. over the entire span. The ratio of their mid-span bending moment will be

- (A) $\frac{1}{2}$
- (B) 2
- (C) 4
- (D) 8

164. In a Mohr's circle of $\sigma - \tau$ plane ($\sigma =$ normal stress, $\tau =$ shear stress), the vertical diameter represents

- (A) Maximum shear stress
- (B) Maximum normal stress
- (C) Principal stress
- (D) Minimum normal stress

165. A simply supported beam is carrying distributed load of 'zero' intensity over one support to linearly varying nature of intensity 'w' over the other support. The shape of BMD will be

- (A) linear
- (B) parabolic
- (C) cubical parabolic
- (D) zero

166. The maximum dimension of a core section for a rectangular cross-section under eccentric loading on a column ($b \times d$) is

- (A) $b/6$
- (B) $d/6$
- (C) $d/8$
- (D) $b/3$ and $d/3$

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167. The moment required to rotate the near end of a prismatic beam through unit angle, without translation, the far end being fixed is
 (A) EI/L (B) $2EI/L$
 (C) $3EI/L$ (D) $4EI/L$
168. A retaining wall of trapezoidal section having base width 'b' retains earth at its back. For no tension to be developed at base, the resultant force will intersect the base from centre line of the base, within a distance of
 (A) $b/3$ (B) $b/4$
 (C) $b/5$ (D) $b/6$
169. Angle of twist of a circular shaft under the action of a torsional moment T is given by
 (A) GJ/TL (B) TL/GJ
 (C) TJ/GL (D) TG/JL
170. A structure which offers negligible or zero resistance on bending at any point is known as
 (A) Beam
 (B) Girder
 (C) Lintel
 (D) Cable
171. The curvature at any point $\left(\frac{1}{R}\right)$ along the curve representing the deformed shape of a beam is given by
 (A) $\pm (dy/dx) / \left[1 + \frac{d^2y}{dx^2}\right]^{1/2}$
 (B) $\pm (d^2y/dx^2) / \left[1 + \left(\frac{dy}{dx}\right)^2\right]^{3/2}$
 (C) $\pm (d^2y/dx^2) / \left[1 + \frac{d^2y}{dx^2}\right]^{1/2}$
 (D) $\pm (dy/dx) / \left[1 + \frac{d^2y}{dx^2}\right]^2$
172. Poisson's ratio μ is defined as the ratio of
 (A) axial strain to transverse strain
 (B) axial strain to shear strain
 (C) transverse strain to axial strain
 (D) shear strain to axial strain
173. In a thin cylindrical shell, the ratio of longitudinal stress to hoop stress is
 (A) 0.5 (B) 1.0
 (C) 1.5 (D) 2.0
174. The grade of concrete M20 means that characteristic compressive strength of 15 cm cubes after 28 days is given by
 (A) 10 N/mm^2 (B) 15 N/mm^2
 (C) 20 N/mm^2 (D) 25 N/mm^2
175. You are asked to construct a massive concrete dam. The type of cement you will use is
 (A) Ordinary portland cement
 (B) Rapid hardening portland cement
 (C) Low heat cement
 (D) Blast furnace slag cement
176. The object of curing is *not* to
 (A) prevent the loss of water by evaporation
 (B) reduce the shrinkage of cement concrete
 (C) preserve the properties of concrete
 (D) reduce the strength of concrete
177. The initial setting time of Ordinary Portland Cement (OPC) is
 (A) 10 min. (B) 30 min.
 (C) 45 min. (D) 60 min.
178. The equivalent stiffness of two springs of stiffness S_1 and S_2 joined in series is given by
 $S =$
 (A) $S_1 S_2 / (S_1 + S_2)$
 (B) $(S_1/S_2) / (S_1 + S_2)$
 (C) $S_1 + S_2$
 (D) $S_1 S_2$
179. Buckling load for an axially loaded column with both ends fixed is given by
 (A) $\pi^2 EI/l^2$ (B) $2\pi^2 EI/l^2$
 (C) $4\pi^2 EI/l^2$ (D) $\pi^2 EI/(4l^2)$

180. Maximum admissible water-cement ratio for mild environmental exposure should be

- (A) 0.55 (B) 0.50
(C) 0.45 (D) 0.40

181. Air entrainment in the concrete increases

- (A) workability
(B) strength
(C) the effect of temperature variation
(D) the unit weight

182. Which of the following is added for quick setting of cement?

- (A) Gypsum
(B) Alum
(C) Zinc sulphate
(D) Aluminium sulphate

183. High percentage of C_3S and low percentage of C_2S in a cement will result in

- (i) rapid hardening
(ii) high early strength with high heat generation
(iii) more resistance to chemical attack

The correct answer is

- (A) Only (i)
(B) Only (iii)
(C) Both (i) and (ii)
(D) Both (ii) and (iii)

184. As per IS 456, splitting tensile strength (f_{cr}) of concrete may be estimated from compressive strength as

- (A) $f_{cr} = 0.65 \sqrt{f_{ck}}$
(B) $f_{cr} = 0.7 \sqrt{f_{ck}}$
(C) $f_{cr} = 0.75 \sqrt{f_{ck}}$
(D) $f_{cr} = 0.8 \sqrt{f_{ck}}$

185. If the modular ratio is 'm', stress ratio in steel and concrete is 'r', then the critical neutral axis constant 'k' is given by

- (A) $m/(m-r)$ (B) $m/(m+r)$
(C) $(m+r)/m$ (D) m^2/r

186. For two way action, i.e. punching shear, the calculated shear stress, τ_v , should satisfy the following relation $\tau_v \leq k_s \tau_c$, where τ_c according to working stress method is expressed as

- (A) $0.1 \sqrt{f_{ck}}$ (B) $0.16 \sqrt{f_{ck}}$
(C) $0.25 \sqrt{f_{ck}}$ (D) $0.4 \sqrt{f_{ck}}$

187. The minimum horizontal distance between two main reinforcement bars should be

- (A) diameter of larger bar or 5 mm more than the nominal maximum size of coarse aggregate, whichever is higher
(B) 5 mm more than the nominal size of the aggregate only
(C) 5 mm more than the diameter of the bar
(D) None of the above

188. During the manufacture of Portland cement, gypsum or Plaster of Paris is added to

- (A) increase the strength of cement
(B) modify the colour of cement
(C) reduce heat of hydration of cement
(D) adjust setting time of cement

189. Minimum percentage of tension steel in an RCC beam for Fe 500 steel is

- (A) 0.12 (B) 0.17
(C) 0.22 (D) 0.80

190. As per IS 456, the effective length of cantilever shall be taken as

- (A) clear span
(B) clear span + effective depth/2
(C) clear span + effective depth
(D) clear span + effective width

191. Side face reinforcement shall be provided in the reinforced concrete beam when depth of web in the beam exceeds
- (A) 500 mm (B) 750 mm
(C) 1000 mm (D) 1200 mm
192. A cantilever retaining wall should *not* be used for heights more than
- (A) 4 m (B) 6 m
(C) 8 m (D) 10 m
193. Diagonal tension in a reinforced concrete beam
- (A) is maximum at neutral axis
(B) decreases below neutral axis and increases above neutral axis
(C) increases below neutral axis and decreases above neutral axis
(D) remains constant throughout the depth
194. In a singly reinforced beam, if the permissible stress in concrete reaches earlier than the permissible stress in steel, the beam section is called
- (A) Under reinforced section
(B) Over reinforced section
(C) Balanced section
(D) Economic section
195. If σ_s is the stress in bar and τ_{bd} is the design bond stress, then the development length of a bar of diameter ϕ is given by
- (A) $\frac{4\phi \sigma_s}{\tau_{bd}}$ (B) $\frac{\phi \sigma_s}{4\tau_{bd}}$
(C) $\frac{2\phi \sigma_s}{3\tau_{bd}}$ (D) $\frac{\phi \sigma_s}{3\tau_{bd}}$
196. The beams supporting the stair steps, are generally known as
- (A) headers
(B) trimmers
(C) stringers
(D) spandrel beam
197. Maximum size of a fillet weld for a plate of square edge is
- (A) 1.5 mm less than the thickness of the plate
(B) one-half of the thickness of the plate
(C) thickness of the plate itself
(D) 1.5 mm more than the thickness of the plate www.previouspapers.in
198. The minimum edge and end distance from the centre of any hole to the nearest flame-cut edge shall *not* be less than
- (A) 1.5 times hole dia
(B) 1.7 times hole dia
(C) 2 times hole dia
(D) 1.5 times bolt / rivet dia
199. The distance between two rivets measured perpendicular to the direction of applied force is known as
- (A) pitch
(B) gauge
(C) staggered pitch
(D) edge distance
200. For simply supported beams, the allowable deflection shall *not* exceed
- (A) 1/325 of span
(B) 1/350 of span
(C) 1/375 of span
(D) 1/400 of span