MPPSC
AE (Civil)

Previous Year Paper
08 Oct, 2023

खण्ड – अ
सामान्य अध्ययन

1. मध्य प्रदेश में सिंचाई का प्रमुख संसाधन क्या है?
   [A] नदी
   [B] नहर
   [C] कुँआ एवं ट्यूबवेल
   [D] तालाब

2. पचमढ़ी में तापमान कम रहने का प्रमुख कारण क्या है?
   [A] ऊँचाई एवं वनस्पति
   [B] कम जनसंख्या एवं वर्षा
   [C] वनस्पति एवं नदियाँ
   [D] नदियाँ एवं झरने

3. निम्नलिखित में से कौन, मध्य प्रदेश के राज्यपाल नहीं थे?
   [A] लालजी टंडन
   [B] कुंवर महमूद अली खाँ
   [C] कैलाश नाथ काटजू
   [D] सरला ग्रेवाल

4. निम्नलिखित में से कौन मध्य प्रदेश के मुख्यमंत्री थे?
   [A] सत्यनारायण सिंह
   [B] रामनरेश यादव
   [C] भगवत दयाल शर्मा
   [D] सुन्दरलाल पटवा

5. मध्य प्रदेश में पंचायती राज व्यवस्था है
   [A] एक स्तरीय
   [B] द्वि स्तरीय
   [C] तीन स्तरीय
   [D] उपर्युक्त में से कोई नहीं

6. भगोरिया पर्व मध्य प्रदेश के किस जिले में मनाया जाता है?
   [A] झाबुआ
   [B] भोपाल
   [C] देवास
   [D] उज्जैन

7. 2011 की जनगणना के अनुसार, मध्य प्रदेश का सबसे कम जनसंख्या घनत्व वाला जिला कौन-सा है?
   [A] डिन्डौरी
   [B] हरदा
   [C] मंडला
   [D] अलीराजपुर

8. 2011 की जनगणना के अनुसार, मध्य प्रदेश का न्यूनतम जनसंख्या वाला जिला कौन-सा है?
   [A] डिन्डौरी
   [B] हरदा
   [C] जबलपुर
   [D] देवास

9. संत शिरोमणि रविदास ग्लोबल स्किल्स पार्क मध्य प्रदेश में कहाँ अवस्थित है?
   [A] भोपाल
   [B] शाजापुर
   [C] छिंदवाड़ा
   [D] नरसिंहपुर

SECTION—A
General Studies

1. What is the major source of irrigation in Madhya Pradesh?
   [A] River
   [B] Canal
   [C] Well and Tubewell
   [D] Pond

2. What is the main cause of low temperature in Pachmarhi?
   [A] Height and vegetation
   [B] Low population and rain
   [C] Vegetation and rivers
   [D] Rivers and waterfalls

3. Who among the following was ***not*** the Governor of Madhya Pradesh?
   [A] Lalji Tandon
   [B] Kunwar Mahmood Ali Khan
   [C] Kailash Nath Katju
   [D] Sarla Grewal

4. Who among the following was the Chief Minister of Madhya Pradesh?
   [A] Satyanarayan Singh
   [B] Ram Naresh Yadav
   [C] Bhagwat Dayal Sharma
   [D] Sunder Lal Patwa

5. The Panchayati Raj system in Madhya Pradesh is
   [A] one tier
   [B] two tier
   [C] three tier
   [D] None of the above

6. In which district of Madhya Pradesh is Bhagoria festival celebrated?
   [A] Jhabua
   [B] Bhopal
   [C] Dewas
   [D] Ujjain

7. According to 2011 census, which is the district with the lowest population density in Madhya Pradesh?
   [A] Dindori
   [B] Harda
   [C] Mandla
   [D] Alirajpur

8. According to 2011 census, which is the least populous district of Madhya Pradesh?
   [A] Dindori
   [B] Harda
   [C] Jabalpur
   [D] Dewas

9. Where is Sant Shiromani Ravidas Global Skills Park located in Madhya Pradesh?
   [A] Bhopal
   [B] Shajapur
   [C] Chhindwara
   [D] Narsinghpur

10. आयुध निर्माणी खमरिया, मध्य प्रदेश के किस जिले में अवस्थित है?

[A] इन्दौर

[B] भोपाल

[C] जबलपुर

[D] सागर

11. मध्य प्रदेश सरकार द्वारा शुरू किया गया 'सौदा-पत्रक मोबाइल एप' किससे संबंधित है?

[A] कृषि क्षेत्र से

[B] औद्योगिक क्षेत्र से

[C] शिक्षा क्षेत्र से

[D] उपर्युक्त में से कोई नहीं

12. 'एक जिला एक उत्पाद' (ODOP) के तहत मध्य प्रदेश में इन्दौर जिले का उत्पाद है

[A] बाँस

[B] प्याज

[C] लहसुन

[D] आलू

13. निम्नलिखित में से कौन, वर्ष 2023 में भारतीय गणतंत्र दिवस के अवसर पर मुख्य अतिथि के रूप में सम्मिलित हुए?

[A] अब्देल फतेह अल-सिसी

[B] जस्टिन ट्रूडो

[C] जो बाइडेन

[D] ऋषि सुनक

14. पी-75 परियोजना के तहत निर्मित कलवरी श्रेणी की किस पनडुब्बी को जनवरी, 2023 में भारतीय नौसेना में सम्मिलित किया गया?

[A] आई०एन०एस० कलवरी

[B] आई०एन०एस० दामिनी

[C] आई०एन०एस० खंडेरी

[D] आई०एन०एस० वागीर

15. 36वें राष्ट्रीय खेलों का आयोजन किस राज्य में सम्पन्न हुआ?

[A] गुजरात में

[B] उत्तर प्रदेश में

[C] झारखण्ड में

[D] केरल में

16. फरवरी, 2023 में 'राष्ट्रीय संस्कृति महोत्सव 2023' का आयोजन कहाँ किया गया?

[A] भोपाल में

[B] भुवनेश्वर में

[C] बेंगलुरु में

[D] मुम्बई में

17. देश का पहला जियोलॉजिकल पार्क, मध्य प्रदेश में कहाँ स्थापित किया जा रहा है?

[A] लम्हेटा गाँव

[B] तामोट

[C] नागौद

[D] हथनोरा

18. 17वाँ प्रवासी भारतीय दिवस कहाँ आयोजित किया गया था?

[A] इन्दौर में

[B] भोपाल में

[C] मुम्बई में

[D] लखनऊ में

10. In which district of Madhya Pradesh is Ordnance Factory, Khamaria situated?

[A] Indore

[B] Bhopal

[C] Jabalpur

[D] Sagar

11. 'Souda-Patrak Mobile App' launched by Government of Madhya Pradesh, is related to which of the following?

[A] Agricultural sector

[B] Industrial sector

[C] Educational sector

[D] None of the above

12. The product of Indore district in Madhya Pradesh under 'One District One Product' (ODOP) is

[A] bamboo

[B] onion

[C] garlic

[D] potato

13. Who among the following attended the Republic Day of India as the chief guest in the year 2023?

[A] Abdel Fattah el-Sisi

[B] Justin Trudeau

[C] Joe Biden

[D] Rishi Sunak

14. Which Kalvari class submarine, built under the P-75 project, was inducted into the Indian Navy in January, 2023?

[A] INS Kalvari

[B] INS Damini

[C] INS Khanderi

[D] INS Vagir

15. In which State was the 36th National Games organised?

[A] Gujarat

[B] Uttar Pradesh

[C] Jharkhand

[D] Kerala

16. In February 2023, 'Rashtriya Sanskriti Mahotsav 2023' was-organized in

[A] Bhopal

[B] Bhubaneswar

[C] Bengaluru

[D] Mumbai

17. Where in Madhya Pradesh, is the country's first Geological Park being set up?

[A] Lamheta Village

[B] Tamot

[C] Nagaud

[D] Hathnora

18. Where was the 17th Pravasi Bharatiya Divas organized?

[A] Indore

[B] Bhopal

[C] Mumbai

[D] Lucknow

19. निम्न में से कौन-सा, मध्य प्रदेश का UNESCO विश्व विरासत स्थल नहीं है?

[A] खजुराहो स्मारकों का समूह

[B] भीमबेटका के रॉक शेल्टर

[C] सांची के बौद्ध स्मारक

[D] विदिशा की उदयगिरि गुफाएँ

20. निम्नलिखित में से किस खेल को मध्य प्रदेश के राज्य खेल के रूप में घोषित किया गया है?

[A] टेबल टेनिस

[B] फुटबॉल

[C] मलखम्ब

[D] बैडमिंटन

21. निम्न में से बालिकाओं के स्वास्थ्य एवं शिक्षा की स्थिति में सुधार के लिए, मध्य प्रदेश सरकार की योजना कौन-सी है?

[A] बेटी बचाओ बेटी पढ़ाओ अभियान

[B] लाडली लक्ष्मी योजना

[C] गाँव की बेटी योजना

[D] बालिका शिक्षा एवं स्वास्थ्य प्रोत्साहन योजना

22. मध्य प्रदेश सरकार की खेत-तालाब योजना के अन्तर्गत किसानों को मिलने वाले अनुदान की अधिकतम सीमा क्या है?

[A] ₹32,000

[B] ₹21,350

[C] ₹16,350

[D] उपर्युक्त में से कोई नहीं

23. मित्र से तुरंत रीयल टाईम संचार के लिए किसका उपयोग करना चाहिए?

[A] ई-मेल (E-mail)

[B] आई०आर०सी० (IRC)

[C] यूजनेट (Usenet)

[D] इंस्टेंट मैसेजिगं (Instant messaging)

24. निम्न में से कौन, एक ई-कॉमर्स ऐक्टिविटी नहीं है?

[A] बी टू बी (B2B)

[B] सी टू बी (C2B)

[C] बी टू ए (B2A)

[D] उपर्युक्त में से कोई नहीं

25. ट्यूरिंग टेस्ट में सहभागियों की संख्या _____ होती है।

[A] एक

[B] तीन

[C] चार

[D] उपर्युक्त में से कोई नहीं

26. फजी लॉजिक का _____ में बहुत सफल उपयोग हो रहा है।

[A] वाशिंग मशीन

[B] एयर कंडीशनर

[C] डिसवाशर

[D] उपर्युक्त सभी

27. निम्न में से किस प्रतीक एवं नियम का उपयोग FOPL में होता है?

[A] प्रेडीकेट

[B] लॉजिक क्वान्टिफायर्स

[C] [A] एवं [B] दोनों

[D] उपर्युक्त में से कोई नहीं

19. Which of the following is ***not*** a UNESCO world heritage site of Madhya Pradesh?

[A] Khajuraho group of monuments

[B] Rock shelters of Bhimbetka

[C] Buddhist monuments at Sanchi

[D] Udayagiri caves of Vidisha

20. Which of the following sports has been declared as the State sport of Madhya Pradesh?

[A] Table Tennis

[B] Football

[C] Mallakhamb

[D] Badminton

21. Which of the following is the scheme of Madhya Pradesh Government for improving the health and education status of the girls?

[A] Beti Bachao Beti Padhao Abhiyan

[B] Ladli Laxmi Yojana

[C] Gaon ki Beti Yojana

[D] Balika Shiksha and Health Protsahan Yojana

22. What is the upper limit of the subsidy given to the farmers under Khet-Talab Yojana of the Madhya Pradesh Government?

[A] ₹32,000

[B] ₹21,350

[C] ₹16,350

[D] None of the above

23. What would you use for immediate real time communication with a friend?

[A] E-mail

[B] IRC

[C] Usenet

[D] Instant messaging

24. Which of the following is ***not*** an E-commerce activity?

[A] B2B

[B] C2B

[C] B2A

[D] None of the above

25. In Turing test, the number of participants is

[A] one

[B] three

[C] four

[D] None of the above

26. Fuzzy logic has been very successful in _____ application.

[A] washing machine

[B] air conditioner

[C] dishwasher

[D] All of the above

27. Which of the following symbols and rules are used in FOPL?

[A] Predicate

[B] Logic Quantifiers

[C] Both [A] and [B]

[D] None of the above

28. निम्नलिखित विकल्पों में से संचार में उपयोगी गाइडेड मीडिया का उदाहरण कौन-सा है?

[A] USB-तरंग

[B] रेडियो तरंग

[C] इन्फ्रारेड

[D] फाइबर ऑप्टिक केबल

29. भारत सरकार के द्वारा NMEICT परियोजना किस विभाग के लिए प्रारंभ किया गया है?

[A] प्रशासनिक विभाग

[B] वित्त विभाग

[C] शिक्षण विभाग

[D] संरक्षण विभाग

30. निम्न में से कौन-सा बस, कम्प्यूटर उपयोगकर्ता को 'प्लग एण्ड प्ले' ऑपरेशन का साधन देता है?

[A] PCI

[B] SCSI

[C] USB

[D] INT

31. आर्टिफिशियल इन्टेलीजेन्स में कम्प्यूटर, मानव के समकक्ष सोचने के लिए काबिल है या नहीं, ये जानने के लिए कौन-सी पद्धति उपयोग होती है?

[A] Alpha Test

[B] A* Algorithm

[C] Turing Test

[D] Beta Test

32. एनालॉग सिग्नल को डिजिटल सिग्नल में रूपांतरित करने की प्रक्रिया का नाम है

[A] क्वांइटाइजेशन

[B] पल्स कोड मॉड्युलेशन

[C] B8ZS

[D] HDB3

33. निम्न में से किस अभिलेख में तन्तुवाय श्रेणी व विवरण मिलता है?

[A] समुद्रगुप्त की प्रयाग प्रशस्ति

[B] चन्द्रगुप्त द्वितीय का सांची अभिलेख

[C] कुमारगुप्त का मन्दसौर अभिलेख

[D] स्कंदगुप्त का भितरी अभिलेख

34. प्राचीन नाम मैकल से निम्न में से किस क्षेत्र का बो होता है?

[A] अमरकंटक

[B] उज्जैन

[C] मालवा

[D] बुन्देलखंड

35. किस चंदेल शासक ने प्रयाग के संगम में जलसमाधि ली थी?

[A] हर्ष

[B] यशोवर्मन

[C] धंग

[D] विद्याधर

36. धार में शारदा सदन की स्थापना किसने करवाई थी?

[A] राजा भोज

[B] विद्याधर

[C] वाक्पति मुंज

[D] सिन्धुराज

28. Which of the following is an example of guided media in communication?

[A] USB-waves

[B] Radio waves

[C] Infrared

[D] Fibre optic cable

29. Government of India has launched NMEICT project for which sector?

[A] Administration sector

[B] Finance sector

[C] Education sector

[D] Conservation sector

30. Which of the following bus provides 'Plug and play' mode of operation to computer user?

[A] PCI

[B] SCSI

[C] USB

[D] INT

31. The method used in Artificial Intelligence, for determining whether a computer is capable of thinking like a human being or ***not***, is called

[A] Alpha Test

[B] A* Algorithm

[C] Turing Test

[D] Beta Test

32. Which technique is used to convert an analog signal to digital signal?

[A] Quantization

[B] Pulse Code Modulation

[C] B8ZS

[D] HDB3

33. Which of the following inscriptions gives an account of a guild of weavers?

[A] Prayag Prashasti of Samudragupta

[B] Sanchi inscription of Chandragupta II

[C] Mandsaur inscription of Kumaragupta

[D] Bhitari inscription of Skandagupta

34. Ancient name Maikal denotes which of the following areas?

[A] Amarkantak

[B] Ujjain

[C] Malwa

[D] Bundelkhand

35. Which Chandela king died by abandoning his body at the confluence of Prayag?

[A] Harsha

[B] Yashovarman

[C] Dhanga

[D] Vidyadhara

36. Who established Sarada Sadan in Dhar?

[A] King Bhoja

[B] Vidyadhara

[C] Vakpati Munja

[D] Sindhuraja

37. उस यूनानी राजदूत का नाम बताइये, जिसने बेसनगर में गरुड़ स्तम्भ की प्रतिष्ठा की।

[A] मेगस्थनीज

[B] हेलियोडोरस

[C] एरियन

[D] मिनाण्डर

38. 'विद्धशालभंजिका' के लेखक कौन थे?

[A] बिल्हण

[B] सोमदेव

[C] भास

[D] राजशेखर

39. 'राम रसायन' के लेखक कौन हैं?

[A] पद्माकर

[B] ईसुरी

[C] राजशेखर

[D] बिल्हण

40. बघेली को उत्तर प्रदेश के किस बोली के निकट माना जाता है?

[A] भोजपुरी

[B] अवधी

[C] खड़ी हिन्दी

[D] ब्रज

41. बुन्देलखंड में लोक देवता के रूप में मान्य हैं

[A] पाबूजी राठौड़

[B] लाला हरदौल

[C] बीर लोरिक

[D] गोगाजी

42. खजुराहो मन्दिर समूह के निर्माता कौन थे?

[A] पाल

[B] प्रतिहार

[C] चन्देल

[D] परमार

43. निम्नलिखित में से मध्य प्रदेश के किस क्षेत्र में सघनतम वन पाये जाते हैं?

[A] दुदवारा – नरसिंहपुर – हवेली

[B] गिर्द – ग्वालियर

[C] सतपुड़ा – मैकल क्षेत्र

[D] उपर्युक्त में से कोई नहीं

44. निम्नलिखित में से कौन-से कथन, मालवा के पठार की **सही** अवस्थिति दर्शाते हैं?

(a) यह मध्य-अधित्यका के पश्चिमी भाग में स्थित है।

(b) यह बेतवा एवं जोहिला की घाटी में स्थित है।

(c) यह बुन्देलखंड अधित्यका के पूर्व में स्थित है।

(d) यह नर्मदा नदी के उत्तर में स्थित है।

[A] *(a)* एवं *(d)*

[B] *(a)* एवं *(c)*

[C] *(b)* एवं *(d)*

[D] *(c)* एवं *(b)*

37. Name the Greek ambassador who established the Garuda Pillar at Besnagar.

[A] Megasthenes

[B] Heliodorus

[C] Arrian

[D] Menander

38. Who was the author of *Viddhasalabhanjika*?

[A] Bilhana

[B] Somadeva

[C] Bhasa

[D] Rajashekhara

39. Who is the author of *Ram Rasayan*?

[A] Padmakar

[B] Ishuri

[C] Rajashekhara

[D] Bilhana

40. Bagheli is closer to which dialect of Uttar Pradesh?

[A] Bhojpuri

[B] Avadhi

[C] Khadi Hindi

[D] Braj

41. Who is accredited as the folk deity at Bundelkhand?

[A] Pabuji Rathore

[B] Lala Hardaul

[C] Veer Lorik

[D] Gogaji

42. Who was the builder of the Khajuraho group of temple?

[A] Pala

[B] Pratihara

[C] Chandela

[D] Paramara

43. Which of the following regions of Madhya Pradesh are densely forested?

[A] Dudwara – Narsinghpur – Haveli

[B] Gird – Gwalior

[C] Satpura – Maikal area

[D] None of the above

44. Which of the following statements represents the ***correct*** location of the Malwa Plateau?

(a) It lies on the western part of central highland.

(b) It lies between Betwa and Johilla valley.

(c) It lies to the east of Bundelkhand highland.

(d) It lies to the north of river Narmada.

[A] *(a)* and *(d)*

[B] *(a)* and *(c)*

[C] *(b)* and *(d)*

[D] *(c)* and *(b)*

45. निम्नलिखित कथनों में से कौन-सा कथन मध्य प्रदेश की जलवायु के संदर्भ में असत्य है?

[A] सर्दियों में औसत न्यूनतम तापमान 10 °C एवं औसत अधिकतम तापमान 25 °C होता है

[B] औसत वार्षिक वर्षा 200 mm से कम होती है

[C] दक्षिण-पूर्वी क्षेत्र में सर्वाधिक वर्षा एवं उत्तर-पश्चिम में उत्तरोत्तर कम वर्षा होती है

[D] उपर्युक्त में से कोई नहीं

46. जोहिला, सोहागपुर, पेंच, कन्हान एवं सिंगरौली क्षेत्रों में कौन-सा ऊर्जा संसाधन सर्वाधिक पाया जाता है?

[A] लौह अयस्क

[B] खनिज तेल

[C] प्राकृतिक गैस

[D] कोयला

47. मैंगनीज अयस्क की प्रमुख पेटी किन जिला क्षेत्रों में पायी जाती है?

[A] श्योपुर, मुरैना, शिवपुरी

[B] बालाघाट, छिंदवाड़ा, झाबुआ

[C] सीधी, कटनी, मंदसौर

[D] ग्वालियर, खण्डवा, भोपाल

48. निम्नलिखित कथनों का अध्ययन करें।

(a) यह मध्य प्रदेश और उत्तर प्रदेश की बहुउद्देशीय परियोजना है।

(b) इस परियोजना के अंतर्गत बेतवा नदी पर अशोक नगर एवं ललितपुर की सीमा पर बांध बनाया गया है।

(c) इस बांध की ऊँचाई 43·80 मीटर एवं लम्बाई 562·50 मीटर है।

निम्न में से कौन-सी सिंचाई परियोजना, ऊपर के कथनों को दर्शाती है?

[A] हरसी

[B] राजघाट

[C] गांधीसागर

[D] बाणसागर

49. छतरपुर जिले में पाया जाने वाला हीरा, निम्नलिखित में से किस विकास खण्ड में अवस्थित है?

[A] बंदर

[B] पिछोर

[C] पिपरिया

[D] उपर्युक्त में से कोई नहीं

50. मध्य प्रदेश सरकार द्वारा किस वर्ष नवीन एवं नवीकरणीय ऊर्जा विभाग का अलग से गठन किया गया?

[A] अप्रैल, 2008

[B] अप्रैल, 2009

[C] अप्रैल, 2010

[D] अप्रैल, 2011

45. Which of the following statements is ***incorrect*** regarding the climate of Madhya Pradesh?

[A] In winter, the mean minimum temperature is 10 °C and the mean maximum temperature is 25 °C

[B] Average rainfall is less than 200 mm

[C] The heaviest rainfall is in the south-eastern part and gradually decreases in north-west

[D] None of the above

46. Which of the following energy resources is found abundantly in Johila, Sohagpur, Pench, Kanhan and Singrauli?

[A] Iron ore

[B] Mineral oil

[C] Natural gas

[D] Coal

47. The most important manganese producing belt lies in which of the following district regions?

[A] Sheopur, Morena, Shivpuri

[B] Balaghat, Chhindwara, Jhabua

[C] Sidhi, Katni, Mandsaur

[D] Gwalior, Khandwa, Bhopal

48. Study the following statements.

(a) It is a multipurpose project of Madhya Pradesh and Uttar Pradesh.

(b) The dam is constructed on Betwa river on the boundary of Ashoknagar and Lalitpur.

(c) The height of the dam is 43·80 meters and length is 562·50 meters.

Which of the following irrigation projects represents the above statements?

[A] Harsi

[B] Rajghat

[C] Gandhi Sagar

[D] Bansagar

49. Diamond, which is found in Chhatarpur district is located in which of the following development blocks?

[A] Bunder

[B] Picchore

[C] Pipariya

[D] None of the above

50. In which year did the Madhya Pradesh Government constitute a separate department of new and renewable energy?

[A] April, 2008

[B] April, 2009

[C] April, 2010

[D] April, 2011

खण्ड – ब / SECTION—B

सिविल इंजीनियरिंग / Civil Engineering

51. Calculate the ultimate first stage BOD of sewage sample whose 5 day's BOD at 20 °C is 100 mg/l. (Assume deoxygenation constant at 20 °C as 0·1)

[A] 68·3 mg/l

[B] 90 mg/l

[C] 146·2 mg/l

[D] 111·1 mg/l

52. In air binding phenomenon, air binds the filter and stops its functioning. This occurs due to the formation of _____ in _____.

[A] mud balls, slow sand filters

[B] negative pressure, rapid gravity filters

[C] dissolved solids, slow sand filters

[D] high temperature, rapid gravity filters

53. A coloured liquid containing chlorinated hydrocarbons and toxic compounds is known as leachate. It is collected from

[A] aerated lagoons

[B] digested sludge tank

[C] sanitary landfills

[D] septic tank

54. A horizontally flowing rectangular sedimentation tank with continuous flow takes time _____ to fill the tank when there are no outflows. Assume Q = discharge, L = length of tank, B = width of tank, H = depth of tank.

[A] Q/BLH

[B] BLH/Q

[C] Q/BL

[D] Q/BH

55. Manholes are generally located at

[A] all junctions of different sewers

[B] any change of gradient in sewer length

[C] any change of diameter in sewers

[D] All of the above

56. As per Goodrich formula, the maximum monthly demand for water supply is _____ of average monthly demand.

[A] 180%

[B] 148%

[C] 128%

[D] 150%

57. Sludge produced in a biological aeration system is having mixed liquor suspended solids as 2500 mg/l and settled sludge volume is 200 ml in 1 litre. Calculate the sludge volume index of the sample.

[A] 0·08 ml/gm

[B] 80 ml/l

[C] 80 ml/gm

[D] 0·08 mg/l

58. Corrosion of metal pipes used in water supply can be reduced by

[A] adding lime or powdered chalk

[B] adding sodium hexa-metaphosphate

[C] doing chlorination of water

[D] Both [A] and [B]

59. As per NAAQS 2009, the maximum permissible annual concentration of PM_{10} and $PM_{2·5}$ respectively in ecologically sensitive areas are

[A] 100 $\mu g/m^3$ and 80 $\mu g/m^3$

[B] 60 $\mu g/m^3$ and 30 $\mu g/m^3$

[C] 60 $\mu g/m^3$ and 40 $\mu g/m^3$

[D] 180 $\mu g/m^3$ and 80 $\mu g/m^3$

60. What should be the minimum DO value to be maintained in river streams to sustain fishes and other aquatic life in river?

[A] 8 mg/l to 10 mg/l

[B] 4 mg/l to 5 mg/l

[C] More than actual DO value

[D] Equal to saturated DO value

61. The rate of flow through per unit cross-sectional area per unit hydraulic gradient is known as

[A] storage coefficient

[B] coefficient of transmissibility

[C] coefficient of permeability

[D] coefficient of variation

62. An intermediate pile of 6 m length is situated at a distance of 24 m from the 6 m long upstream pile. The total floor length is 60 m. Then the correction value at C_1 (rear point of the upstream pile in the direction of flow) in determining the percentage pressure for mutual interface of pile is

[A] 1·49

[B] 1·90

[C] 2·05

[D] None of the above

63. To estimate evapotranspiration, the assumption that monthly temperature and mean monthly consumptive use have on exponential relationship is known as

[A] Penman formula

[B] Blaney-Criddle method

[C] Christiansen method

[D] Thornthwaite formula

64. Hydropower production in hydropower plant mainly depends on

[A] rainfall

[B] coal availability

[C] reservoir width

[D] cost

65. When canal is taken over the natural drain and drain bed is generally depressed, the cross-drainage work is known as

[A] syphon

[B] aqueduct

[C] superpassage

[D] syphon aqueduct

66. An S-curve is obtained by the summation of 4 hr unit hydrograph for a catchment of 60 km^2. The equilibrium discharge in m^3/s is

[A] 9·28

[B] 18·53

[C] 41·70

[D] 55·24

67. If the initial and sequent depths of a hydraulic jump are 1·2 m and 3·6 m respectively, then the value of Froude number F_1 and the type of jump are

[A] F_1 = 2·445, weak jump

[B] F_1 = 2·445, undular jump

[C] F_1 = 4·255, steady jump

[D] F_1 = 4·255, strong jump

68. Which of the following is ***not*** the main function of head regulator?

[A] To regulate or control the supplies entering the off-take channel

[B] To effectively control the entire canal irrigation system

[C] To serve as a meter for measuring discharge

[D] To control silt entry into the off-take channel

69. If irrigation water is carrying Ca, Mg and Na concentration as 5, 3 and 38 milliequivalents per litre respectively, then sodium absorption ratio and type of water are

[A] 17, medium sodium

[B] 17, high sodium

[C] 19, medium sodium

[D] 19, high sodium

70. At the outlet of a watershed, a triangular 4 hr unit hydrograph with ordinate 6 (m^3/s) and base 6 hr is developed, then area (km^2) of the watershed is

[A] 4·32

[B] 6·48

[C] 8·64

[D] None of the above

71. The headloss due to contraction is expressed as _____. (Here $V_1 = V_C$)

[A] $\left(V_1^2 - V_2^2\right)/2g$

[B] $\left(V_2^2 - V_1^2\right)/2g$

[C] $0{\cdot}55(V_1 - V_2)^2/2g$

[D] $(V_1 - V_2)^2/2g$

72. The term alternative depth is used in an open channel flow to denote the depths having the same _____ for a given discharge.

[A] kinetic energy

[B] potential energy

[C] specific energy

[D] total energy

73. If E is specific energy at a section in a gradually varied flow, then $\frac{dE}{dx}$ is

[A] $S_o + S_f$

[B] $S_o - S_f$

[C] $S_f - S_o$

[D] $S_f / S_o - 1$

where S_o is bed slope

S_f is energy slope

74. A rectangular channel 2·5 m wide carries water at a depth of 1·2 m. The bed slope of the channel is 0·0036. Calculate the average shear stress on the boundary.

[A] 21·58 Pa

[B] 25·85 Pa

[C] 22·65 Pa

[D] None of the above

75. Lift force (F_L) is expressed mathematically as F_L =

[A] $\frac{1}{2}\rho v^2 C_L$

[B] $\frac{1}{2}\rho v^2 C_L A$

[C] $2\rho v^2 C_L A$

[D] $1\rho v^2 C_L A$

where ρ = Density

C_L = Coefficient of lift

A = Area of the body which is the projected area to the body perpendicular to the direction of flow

v = Uniform velocity

76. Bernoulli's equation from Euler's equation deals with the law of conservation of

[A] mass

[B] momentum

[C] energy

[D] None of the above

77. Find the discharge through a totally drowned orifice 2 m wide and 1 m deep, if the difference of water levels on both the sides of the orifice be 3 m. Take C_d = 0·62.

[A] 6·432 m^3/sec

[B] 7·356 m^3/sec

[C] 8·783 m^3/sec

[D] 9·513 m^3/sec

78. The stream function $\psi = x^3 - y^3$ is observed for a two-dimensional flow fluid. What is the magnitude of the velocity at point (1, –1)?

[A] 4·24

[B] 2·83

[C] 2·33

[D] 3·87

79. A model of reservoir is drained in 5 minutes by opening a sluice gate. The model scale is 1 : 256. How much time would it take to empty the prototype?

[A] 80 minutes

[B] 60 minutes

[C] 70 minutes

[D] 90 minutes

80. A flat plate of size 2 m × 3 m is submerged in water flowing with a velocity of 5 m/sec. Find the drag (in kN), if C_d = 0·04.

[A] 13

[B] 15

[C] 12

[D] None of the above

81. Using the sleeper density of (m + 6) for a BG track, determine the number of sleepers required for construction of 100 panels of 13 metres each.

[A] 1300

[B] 1306

[C] 1900

[D] None of the above

82. The standard top width of ballast for BG track of Indian Railways is

[A] 3·35 m

[B] 3·53 m

[C] 2·35 m

[D] 2·53 m

83. Centre-to-centre minimum spacing of formation for double railway line for BG is

[A] 4250 mm

[B] 4725 mm

[C] 5050 mm

[D] 5350 mm

84. The type of fastening that can be fixed on wooden, steel, cast iron and concrete sleeper is

[A] pandrol clip

[B] IRN 202 clip

[C] lock spike

[D] two-way keys

85. The value of maximum allowable superelevation on BG in Indian Railways under normal conditions is

[A] 100 mm

[B] 140 mm

[C] 165 mm

[D] 185 mm

86. For determining the number of angles of crossing, the method used in Indian Railways is

[A] right angle method

[B] centreline method

[C] isosceles triangle method

[D] None of the above

87. A falling gradient followed by a rising gradient is known as

[A] ruling gradient

[B] pusher gradient

[C] angular gradient

[D] momentum gradient

88. Gauge tolerance for BG on a straight track is

[A] –3 mm to +6 mm

[B] –6 mm to +6 mm

[C] –6 mm to +15 mm

[D] Up to +20 mm

89. Match ***correctly*** the given nature of resistance with its understanding :

Nature of resistance	***Understanding***
(i) Resistance due to friction	*(a)* Resistance dependent on weight and speed of train
(ii) Resistance due to wave action	*(b)* Resistance dependent on weight of train only
(iii) Resistance due to wind	*(c)* Resistance dependent on weight and square of speed of train

[A] *(i)-(a), (ii)-(b), (iii)-(c)*

[B] *(i)-(a), (iii)-(b), (ii)-(c)*

[C] *(ii)-(a), (i)-(b), (iii)-(c)*

[D] *(i)-(c), (ii)-(b), (iii)-(a)*

90. In Standard–II interlocking on Indian Railways, the maximum speed of the train is

[A] 50 kmph

[B] 110 kmph

[C] 130 kmph

[D] None of the above

91. The Bombay road plan commenced from

[A] 1958-78

[B] 1959-79

[C] 1960-80

[D] 1961-81

92. The Indian Road Congress (IRC) was formed in the year

[A] 1934

[B] 1935

[C] 1936

[D] 1937

93. The Intermediate Sight Distance can be defined as

[A] the same distance equal to stopping sight distance

[B] twice the stopping sight distance

[C] thrice the stopping sight distance

[D] the distance visible to driver during night driving, under the vehicle headlights

94. Which of the following is the typical rigid pavement failure?

[A] Frost heaving

[B] Water pumping

[C] Mud pumping

[D] None of the above

95. The Passenger Car Unit (PCU) value for bus and truck on urban roads at signalised intersection is

[A] 1·0

[B] 0·3

[C] 0·4

[D] 2·8

96. Direction and place identification signs are

[A] regulatory signs

[B] warning signs

[C] informatory signs

[D] prohibitory signs

97. For airports serving big aircrafts ICAO recommends that the cross wind component should ***not*** b more than _____ kmph.

[A] 35

[B] 40

[C] 50

[D] 55

98. As per Indian Road Congress (IRC), the range of class *A* loading varies from _____ tonnes.

[A] 2·5 to 10·0

[B] 2·6 to 11·2

[C] 2·7 to 11·4

[D] None of the above

99. The IRC code for the standard specification and code of practice for road bridges is

[A] IRC-20

[B] IRC-21

[C] IRC-18

[D] None of the above

100. Reinforced concrete railway bridges have been used up to the span of _____ m.

[A] 10

[B] 15

[C] 20

[D] 25

101. Which of the following clay minerals has lowest base exchange capacity in terms of meq per 100 gm?

[A] Illite

[B] Kaolinite

[C] Montmorillonite

[D] None of the above

102. The unit weight of solids (γ_s) for a soil is 27 kN/m^3 and unit weight of water (γ_w) is 10 kN/m^3. If void ratio is 70%, then the submerged unit weight (γ_b) for the soil is _____ kN/m^3.

[A] 10·00

[B] 20·00

[C] 21·76

[D] 24·28

103. If two permeable soil layers of equal thickness have permeabilities k and $2k$, then the equivalent coefficient of permeability k_v is

[A] $k/2$

[B] $2/3\ k$

[C] $4/3\ k$

[D] $3/2\ k$

104. Boussinesq's stress coefficient with $\frac{r}{z} = \sqrt{3}$, for a point load is

[A] $\frac{3}{64\pi}$

[B] $\frac{3}{32\pi}$

[C] $\frac{3}{16\pi}$

[D] $\frac{3}{8\pi}$

105. The type *B*, one and one-half peak compaction curve is obtained when the liquid limit of soil is

[A] in the range of 30% to 70%

[B] greater than 70%

[C] less than 30% and greater than 70%

[D] less than 30%

106. For a triaxial shear test on a soil sample with C = 50 kN/m^2 and $\phi = 30°$, $\sigma_3 = 100$ kN/m^2, the soil sample failed. So σd = ____ kN/m^2.

[A] 373

[B] 473

[C] 161

[D] 261

107. In *C* soils, local shear failure may be assumed to occur in soft to medium stiff clay with an unconfined compressive strength (q_u), ____ kPa.

[A] ≤ 250

[B] ≤ 100

[C] ≤ 150

[D] ≤ 200

108. In stability of slopes, $\frac{C}{\gamma H}$ is called as (Symbols have their usual meanings)

[A] critical number

[B] mobilization number

[C] stability factor

[D] stability number

109. Choose the ***correct*** descending order of electrical resistivity, for the following different soils :

(a) Sandy clay

(b) Clayey sand

(c) Sand

(d) Gravel

[A] *(a), (b), (c), (d)*

[B] *(d), (c), (b), (a)*

[C] *(b), (a), (d), (c)*

[D] *(c), (b), (d), (a)*

110. The vibroflotation technique

[A] is used for compacting clayey soils only

[B] is used for compacting any type of soil

[C] is used for compacting granular soils only

[D] All of the above

111. The relation between Young's Modulus of Elasticity (E), Bulk Modulus (K) and Modulus of Rigidity (C) is

[A] $E = \frac{9KC}{3K+C}$

[B] $E = \frac{9KC}{3K-C}$

[C] $E = \frac{3K+C}{9KC}$

[D] $E = \frac{3K-C}{9KC}$

112. If any beam or truss is having a deflection 'Δ_1' at any point D, due to a load W at any point C, then what will be the deflection at the point C due to the same load W applied at point D, according to Maxwell's reciprocal deflection theorem?

[A] Half of Δ_1

[B] Less than Δ_1

[C] Equal to Δ_1

[D] Greater than Δ_1

113. Match the following :

List—I	***List—II***
(a) Maximum principal stress theory	(i) Beltrami or Haigh
(b) Maximum principal strain theory	(ii) Tresea
(c) Maximum shear stress theory	(iii) Rankine
(d) Maximum strain energy theory	(iv) ST. Venant

	(a)	(b)	(c)	(d)
[A]	(iii)	(iv)	(ii)	(i)
[B]	(ii)	(i)	(iii)	(iv)
[C]	(iii)	(i)	(ii)	(iv)
[D]	(iv)	(iii)	(i)	(ii)

114. A solid shaft having diameter d is subjected to a torque T at its ends. The maximum shear stress developed will be

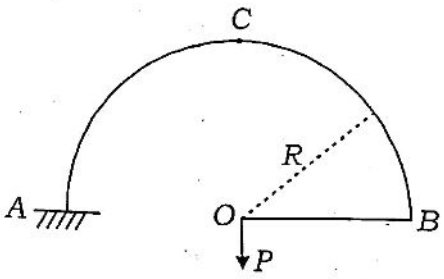
[A] $\frac{\pi d^3}{16T}$

[B] $\frac{\pi d^3}{32T}$

[C] $\frac{16T}{\pi d^3}$

[D] $\frac{32T}{\pi d^3}$

115. A semicircular bracket ABC of radius R is fixed at A. A rigid horizontal arm BO of length R is attached at B. The bracket carries a vertical load P at O. The vertical deflection of the load is given by



[A] $\frac{PR^3}{3EI}$

[B] $\frac{\pi PR^3}{2EI}$

[C] $\frac{PR^3}{6EI}$

[D] $\frac{\pi PR^2}{12EI}$

116. What are the values of maximum shear force and maximum bending moment for a simply supported beam carrying a load whose intensity varies uniformly from zero at one end to w per unit run at the other end?

[A] $\frac{wl}{6}; \frac{wl^2}{9\sqrt{3}}$

[B] $\frac{wl}{3}; \frac{wl^2}{9\sqrt{3}}$

[C] $\frac{wl}{4}; \frac{wl^2}{8}$

[D] $\frac{wl}{2}; \frac{wl^2}{16}$

117. In a rectangular element subjected to like principal stresses P_1 and P_2 in two mutually perpendicular directions, the greatest shear stress would occur along the

[A] plane carrying principal stress P_1

[B] plane carrying principal stress P_2

[C] planes at angles 45° and 135° with the principal plane carrying the principal stress P_1

[D] planes at angles 90° and 0° with the principal plane carrying the principal stress P_1

118. In a two-dimensional stress system, Mohr's circle of stress for two unequal unlike principal stresses is drawn. The radius of Mohr's circle drawn for this case represents

[A] maximum principal stress

[B] minimum principal stress

[C] maximum shear stress

[D] maximum shear strain

119. A fixed beam is having length l and carrying uniformly distributed load w throughout the span. The distance of point of contraflexure from the centre of span is given by

[A] $l/\sqrt{3}$

[B] $l/\sqrt{2}$

[C] $l/2\sqrt{3}$

[D] $l/3\sqrt{2}$

120. A cantilever 3 m long carries a uniformly distributed load over the entire length. If the slope at the free end is 1°, the deflection at the free end will be

[A] 6·5π mm

[B] 10·5π mm

[C] 12·5π mm

[D] 15·0π mm

121. When the effect of wind or earthquake load is taken into account, the permissible stress in the steel structural member may be increased by

[A] 20%

[B] 25%

[C] 33%

[D] 40%

122. If the allowable shear stress in rivet is 100 N/mm^2, then the strength of a 22 mm diameter rivet in single shear will be

[A] 39194 N

[B] 41608 N

[C] 43374 N

[D] 46000 N

123. The design compressive stress (f_{cd}) of axially loaded compression members is given by

[A] $\left[\frac{f_y}{\gamma_{mo}}\right] / \left[\phi - \left(\phi^2 - \lambda^2\right)^{0.5}\right]$

[B] $\left[\frac{f_y}{\gamma_{mo}}\right] / \left[\phi + \left(\phi^2 - \lambda^2\right)^{0.5}\right]$

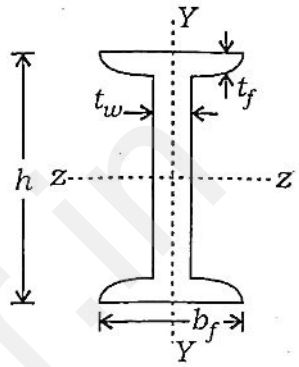
[C] $\left[\frac{\gamma_{mo}}{f_y}\right] / \left[\phi - \left(\phi^2 - \lambda^2\right)^{0.5}\right]$

[D] $\left[\frac{\gamma_{mo}}{f_y}\right] / \left[\phi + \left(\phi^2 - \lambda^2\right)^{0.5}\right]$

where all symbols have their usual meanings.

124. For a rolled steel I-section with $h/b_f \le 1{\cdot}2$ and $t_f \le 100$ and buckling about z-z axis, the buckling class of the member is

(All symbols have their standard meanings.)



Rolled I-Section

[A] buckling class d

[B] buckling class c

[C] buckling class a

[D] buckling class b

125. An I-section purlin of span 4·50 m is subjected to a total gravity load of 5000 N. The purlin will be designed for maximum bending moment of (in N-m)

[A] 2250

[B] 1111·11

[C] 12650

[D] 11250

126. As per IS 800 : 2007, for plastic analysis, the cross-section of the member should be

[A] subjected to impact loading

[B] symmetrical about its axis perpendicular to the axis of plastic hinge rotation

[C] made of steel having yield stress more than 450 mPa

[D] Only [A] and [B]

127. Lug angle is

[A] a short length of angle section used to reduce the length of joint

[B] usually highly recommended in tension members

[C] an angle section provided to join two sections

[D] provided to resist shear

128. Mansard trusses are variation of

[A] Pratt truss

[B] Fan truss

[C] Fink truss

[D] Howe truss

129. Gusseted base is used for column to carry

[A] medium load

[B] dead load

[C] only static load

[D] heavy load

130. Battens are used to connect the main components of

[A] tension member

[B] compression member

[C] flexural member

[D] torsional member

131. An *RC* beam is 200 mm wide an having 350 mm effective depth. Th permissible stresses in concrete an steel are 5N/mm^2 and 140 N/mm respectively. The percentage of ste required is (take m = 18·66)

[A] 1·0

[B] 0·32

[C] 0·714

[D] 1·22

132. The degree of end restraint c compression member is given as "Effectively held in position at bot ends, restrained against rotatio at one end".

As per IS : 456 : 2000 th recommended value of effecti length is (where l = unsupporte length of compression member)

[A] 0·65 l

[B] 1·20 l

[C] 0·80 l

[D] 0·10 l

133. For a T-beam, the effective width of flange can be taken as

[A] $b_f = \frac{l_o}{6} + b_w + 6D_f$

[B] $b_f = \frac{l_o}{3} + 3b_w + 3D_f$

[C] $b_f = \frac{l_o}{12} + b_w + 3D_f$

[D] $b_f = \frac{l_o}{6} + 6b_w + 6D_f$

where b_f = effective width of flange

l_o = distance between points of zero moments in the beam

b_w = breadth of the web

D_f = thickness of flange

b = actual width of flange

134. For the limit state of serviceability, the value of partial safety factor γ_f for $DL + IL + WL$ combination will be

[A] $1{\cdot}5\,DL + 1{\cdot}5\,IL + 1{\cdot}0\,WL$

[B] $1{\cdot}0\,DL + 1{\cdot}0\,IL + 0{\cdot}8\,WL$

[C] $1{\cdot}0\,DL + 0{\cdot}8\,IL + 0{\cdot}8\,WL$

[D] $0{\cdot}9\,DL + 1{\cdot}2\,IL + 1{\cdot}5\,WL$

where DL = Dead load

IL = Imposed load

WL = Wind load

135. The approximate fundamental translational natural period (T_a) of oscillation in second of a moment resisting RC frame building without any masonry infills may be estimated by which of the following expressions (where h is height of building in meters)?

[A] $0{\cdot}085\,h^{0{\cdot}75}$

[B] $0{\cdot}075\,h^{0{\cdot}75}$

[C] $0{\cdot}090\,h^{0{\cdot}75}$

[D] $0{\cdot}060\,h^{0{\cdot}75}$

136. A pretensioned concrete beam of rectangular cross-section, 150 mm wide and 300 mm deep, is prestressed by high tensile wires of total cross-section area 300 mm^2. All wires are located at 100 mm from the soffit of the beam. If the wires are tensioned to a stress of 1000 N/mm^2, the percentage loss of stress due to elastic deformation is equal to (Take E_C = 30 kN/mm^2, E_s = 200 kN/mm^2)

[A] 5·926

[B] 6·666

[C] 2·333

[D] None of the above

137. As per IS 3370 (Part 2) : 2009, the crack width for reinforced concrete member in direct tension and flexural tension may be deemed to be satisfactory, if steel stress under service conditions does not exceed _____ for high strength deformed bars.

[A] 115 N/mm^2

[B] 190 N/mm^2

[C] 130 N/mm^2

[D] None of the above

138. The minimum grade of concrete used for the design of reinforced concrete water tank is _____ and that for the design of prestressed concrete water tank is

[A] M30; M40

[B] M20; M35

[C] M15; M40

[D] M20; M40

139. When the allowable soil pressure is low or the building loads are heavy, in such cases a footing is provided that covers the entire area beneath a structure and supports all the walls and columns known as

[A] pile foundation

[B] combined footing

[C] raft foundation

[D] strap footing

140. For a column with rectangular section, as per IS 456 : 2000 code, all columns shall be designed for a minimum eccentricity equal to (l = unsupported length of column)

[A] $\frac{l}{500} + \frac{\text{lateral dimension}}{30}$ or 20 mm whichever is greater

[B] $\frac{l}{500} + \frac{\text{lateral dimension}}{30}$ or 20 mm whichever is less

[C] $\frac{l}{500} + \frac{\text{lateral dimension}}{20}$

[D] $\frac{l}{300}$ or 20 mm whichever is greater

141. What is "Optimistic Time Estimate" in Project Management?

[A] The maximum possible time an activity could take to complete

[B] The average time calculated from historical data

[C] The estimate of the shortest possible time under ideal conditions

[D] The time estimate which lies between optimistic and pessimistic estimates

142. What is "Expected Time" in PERT analysis?

[A] The most optimistic time estimate for completing an activity

[B] The average optimistic, pessimistic and most likely time estimates for completing an activity

[C] The time estimate for completing an activity with the highest probability

[D] The longest time estimate for completing an activity

143. What is the purpose of "Crash Time" in Project Management?

[A] It is the time taken to complete an activity under normal conditions

[B] It is the maximum allowable time for completing an activity

[C] It is the minimum possible time for completing an activity using extra resources

[D] It is the time beyond which an activity cannot be shortened

144. What effect does extending the boom of a crane have on its load rating?

[A] It increases the load rating

[B] It does not affect the load rating

[C] It decreases the load rating

[D] It depends on the type of crane

145. Why are detachable curved plates and spikes used in transporting a sheep-foot roller?

[A] To protect the roller's drum

[B] To save fuel during transportation

[C] To prevent damage to existing tracks

[D] To reduce the overall weight of the roller

146. How are loads adjusted on the wheels of a smooth wheeled roller?

[A] By replacing the wheels with different sizes

[B] By filling the wheels with sand, gravel or water

[C] By reducing the number of wheels

[D] By attaching additional weights to the roller

147. Which component is ***not*** responsible for setting and hardening of cement?

[A] Dicalcium silicate

[B] Tetra calcium aluminoferrite

[C] Tricalcium aluminate

[D] Calcium sulphate

148. How is the Le-Chatelier apparatus used in the Soundness Test?

[A] To measure the extension of a standard specimen

[B] To calculate the normal consistency of cement paste

[C] To assess the compressive strength of concrete

[D] To determine the quantity of water required for mixing

149. Which type of aggregate shape results in the highest voids in concrete?

[A] Rounded

[B] Angular

[C] Cubical

[D] Flaky

150. What is the recommended limit for air entrainment in concrete to avoid decreasing of its strength?

[A] Up to 2%

[B] Up to 4-5%

[C] Up to 8-10%

[D] Up to 15%